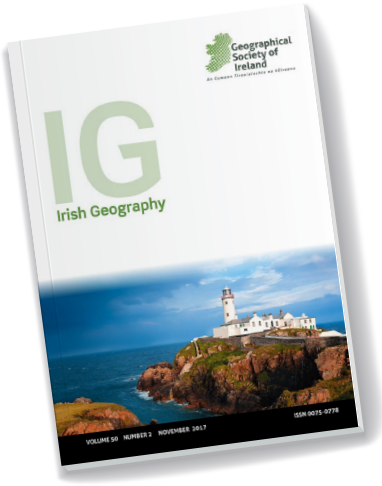

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Continuity and Change: The geo-demographic structure of Ireland's population of farmers

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Abstract: Drawing on the Census of Agriculture, a small number of researchers have developed a substantial body of literature describing and evaluating the changing structure of farms and farm enterprises in Ireland. This paper contributes to that body of work through the development and application of a geo-demographic typology. The research highlights the ageing of the population of farmers between 2000 and 2010 and describes the resulting spatial patterns. The application of the geo-demographic typology enables the association between farmer age and the outcomes to processes resulting in the geographic specialisation of farm enterprises to be identified and assessed. The paper then considers the potential implications of intergenerational transfer of land and farms to a new generation of land-holders. In this context, the land use intentions of this group of land-holders will shape the future development of the sector, not only in terms of food production and the attainment of targets set out in agri-food development strategies, but also in terms of meeting societal demands for the production of renewable energy and mitigation of climate change through afforestation. The research highlights the on-going attachment to the land amongst most respondents even in those cases where the farm enterprise is not economically viable, and associated with this, the need for off-farm sources of income.

Keywords: *Agricultural restructuring, farming, geo-demographic typology, succession*

1. Introduction

Internationally, the issue of farmer demography is widely recognised as a key factor in farm enterprise development (Scully, 1969; Lafferty *et al.,* 1999; Hennessy and Rehman, 2007; Nuthall and Old, 2016), land use or land use change (Potter *et al.,* 1996), environmental performance of farms (Lobley *et al.,* 2009; McCracken, 2015), and, unsurprisingly, farm succession. Many of the key issues associated with farm enterprise development are

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linked to household lifestage or life course events, particularly the period leading up to and following intergenerational transfer of the farm assets and enterprises. There is a substantial body of work in this area exploring the various dimensions of succession and non-succession (Gilmore, 1999; Hennessy and Rehman, 2007; Coradini, 2015; Kishener *et al.,* 2015; Chiswell, 2016; Leonard *et al.,* 2017; Duesberg *et al.,* 2017). Much of this research is characterised by an emphasis on identification of the factors supporting early or successful succession with substantial attention given to the attitudes and characteristics of the farm holder, the farm household, the farm enterprise and, a limited number of cases, the attitudes and characteristics of the potential successor. The emphasis on succession reflects a long-term policy concern with the age structure of the population of farmers. Much of this concern centres on the perceived need to support earlier entry into farming by younger farmers as a means of improving the adoption of knowledge or technology with the objective of enhancing enterprise efficiency and financial or ecological performance (Ni Laoire, 2002; O'Neill *et al.,* 2001; Duesberg *et al.,* 2017). Despite widespread recognition of the importance of the demographic characteristics of farm holders in social and economic analyses of agricultural change, these have received relatively little attention in spatial analyses of agriculture and agriculture restructuring in Ireland.

This paper foregrounds the issue of the age structure of the population of farmers by way of reflecting on how farming has evolved in Ireland in recent decades as the population of farmers has aged. It focuses on exploring the geo-demographic structure of the farm population during the period 2000-2010 with the objectives of drawing attention to the contemporary demographic structure of the population and how this has evolved, describing the spatial distribution of older farmers and evaluating changes to this distribution through the application of a geo-demographic typology. This typology is subsequently applied to develop a novel perspective of the spatial patterns associated with farming in Ireland and highlights the centrality of the geo-demographic structure of the population of farmers to processes and outcomes of geographic specialisation of farm enterprises. The results of this analysis are discussed with reference to findings from an attitudinal survey of potential future farmers to farming and land use by way of identifying potential changes to farming and land use that may emerge in coming years as a new generation of land owners/farmers chart their own course. Whilst the latter analysis is preliminary in nature, it contributes to a small but growing body of literature that emphasises the significance of understanding what future generations of land-holders or farmers may do with the land. This is an increasingly important issue given that many of these land-holders may not choose to actively farm the land themselves (Cassidy, 2017, this issue).

2. Viewing agricultural change through the Census of Agriculture

The first Census of Agriculture was conducted in 1847 and subsequently taken on an annual basis up to the early 1950s, following which censuses were implemented every five years between 1960 and 1980, and roughly every ten years after that. The last Census of Agriculture was taken on 1 June 2010 with the collection of detailed statistics on the structure of farming in Ireland. Reflecting improvements in data collection, compilation and dissemination over the years, the spatial scale at which these data have been made available has increased over time, i.e. from the Rural District level in the 1960s, 1970s and 1980s to the Electoral Division (ED) scale from the 1990s onwards. Geographers have made use of these data to chart spatial patterns of agricultural production and changes to these over time. A number of Census Atlases have been produced which, in addition to providing an overview of changes to farming and agricultural practices, give an insight into the evolving focus of agricultural and rural geographers, i.e. from charting patterns to analyses of the political economy of agricultural regulation.

Research by Horner *et al.* (1984) made extensive use of Census of Agriculture data to explore spatial variation in agricultural land use, farm structures and farm systems. This work, which highlighted stark differences between the south and east of the country, compared with the north and west, built on the work of Scully (1969). The latter work highlighted variation in farm structures, i.e. the size and scale or intensity of farms, and, in particular, the association between small farm scale, rural depopulation, the consequent high age profile of the population and decline of rural towns in the Western Region. Horner *et al.* (1984) used the 1980 Census of Agriculture to explore spatial variation, at the scale of the Rural District (n=191), in farm structures and enterprises and compared these to the 1970 census. Their analysis gave considerable attention to the adoption of farm technology, i.e. machinery and equipment, highlighting geographic variations in the level and rate of adoption. This work inspired subsequent research published by Lafferty *et al.* (1999). Combining Rural District and Electoral Division (ED) level data taken from the 1991 Census of Agriculture, Lafferty *et al.* (1999) focused on providing a detailed assessment of local level variation in agriculture enterprises and practices. Where this study substantially differed from that of Horner *et al.* (1984) was the emphasis placed on framing changes to agriculture within the context of a rapidly changing international policy environment. The 1990s saw the Common Agriculture Policy (CAP) begin the shift away from payment for production towards a system that, for many farm enterprises, meant a decoupling of payment from production, i.e. the introduction of direct payments or, as it was referred to colloquially, the cheque in the post. Policy supports for the production or maintenance of public goods were introduced as were incentives to encourage diversification of the rural economy. These regulatory or governance developments took place alongside sets of economic and technological changes that gave rise to 'enlargement of farm business scale, labour outflow, concentration of production, polarisation of farm incomes, greater reliance on off-farm incomes and, the closer integration of agricultural practices with broader rural economic, social and

environmental objectives'. (Lafferty *et al.,* 1999, p.140). Whilst many of these themes and issues had been identified by Scully (1969), O'Cinneide and Cawley (1983), Gilmore (1965), and Horner *et al.* (1984), Lafferty *et al.* (1999) highlighted the relationship between the dominant governance framework and the changes taking place at the local scale, i.e. how the system of governance resulted in uneven patterns of development. They also utilised statistical techniques to identify a spatial typology of farming regions that were classified by type of farm enterprise. This work heavily influenced research by Crowley (2007) who exploited the availability of ED level census data for 1991 and 2000 to provide a detailed assessment of change in farm structures and enterprises. Crowley's analysis was framed by an evaluation of the intersections of policy, agriculture regulatory systems, farm structures and farm enterprises to provide a comprehensive assessment of the divergent spatial trajectories shaping patterns of agricultural restructuring between 1991 and 2000. Key findings from this research highlighted the spatial proliferation of specialist beef enterprises through enterprise substitution on small-scale dairy farms in the dairying regions and mixed grazing livestock farms in lowland sheep farming areas. This transition was driven by increasing economies of scale amongst dairy enterprises, resulting in those with limited access to, particularly, additional milk quota, converting to beef production. In what were traditionally lowland sheep areas, the transition was prompted by the need or opportunity to improve household income by rationalising resources through the adoption of a less labour-intensive enterprise, i.e. beef production, and thereby allow farmers to secure off-farm employment. Crowley (2007) identified five agriculture regions or zones: areas of High Nature Value farmland (HNVf), agricultural sustainability through part-time farming and areas of waste management challenge in the north and west of the country and a further two zones in the south and east; areas of commercial agriculture and areas facing threats to agricultural sustainability. Whilst there were a variety of differences between the agricultural regions identified by Lafferty *et al.* (1999) and Crowley (2007) there were also some similarities, most notably in western, coastal areas which were categorised as 'Sheep' areas in the former and HNVf in the latter research. Whilst differences in the respective typologies are to be expected, given the use of different techniques and variables in each analysis, it is interesting that the trend of greater prominence being given to public goods identified by Lafferty *et al.* (1999) is manifest in Crowley's (2007) analysis.

The analyses developed by Horner *et al.* (1984), Lafferty *et al.* (1999) and Crowley (2007) emphasise farm enterprises and farm structures. Whilst the human dimension is central to these analyses of farming and agricultural change in Ireland, the geo-demographic profile of farmers is not foregrounded. Rather, Lafferty *et al.* (1999) describe the concentration of older farmers, i.e. those over 65, in Galway, Mayo, Roscommon, Sligo, Leitrim, Donegal and western parts of Kerry. Crowley (2007) similarly describes the distribution of farmers over 65 years of age and links this to an exploration of the functioning and impacts of the Early Farmer Retirement Scheme, an EU funded initiative designed to encourage earlier transfer of the farm assets to younger farmers. Once again, the concentration of older farmers in areas of the north and west was highlighted. Both

pieces of research make the association, but do not provide additional analyses, between the age structure of the population of farmers and farm structures. Lafferty *et al.* (1999) concludes, reflecting Scully's (1969) perspective, that older farmers had a negative effect on farm productivity due to a reluctance to adopt new technologies and practices. Crowley (2007) presents a more nuanced view that farms which were not economically viable or cannot be sustained through a combination of farm and off-farm sources of income are unlikely to attract successors willing to operate the farm enterprise. This raises the question of what successors to such farms might do with the land, a question that we seek to address in this paper. Before doing so, we present a descriptive analysis of the demographic structure of the population of farmers in Ireland and evaluate how this has evolved since 1991.

3. The demographic structure and spatial distribution of Ireland's population of farmers 1991-2010

The 1991 Census of Agriculture recorded a total of 171,884 farmers. By 2000, this population had fallen to 143,342, a decline of 21%. Between 2000 and 2010 the population fell again but this time by only 1,776, to 141,566. Associated with these developments were substantial changes to the age structure of the population of farmers with declines in the number of younger farmers and increases in the number of older farmers (Figure 1).

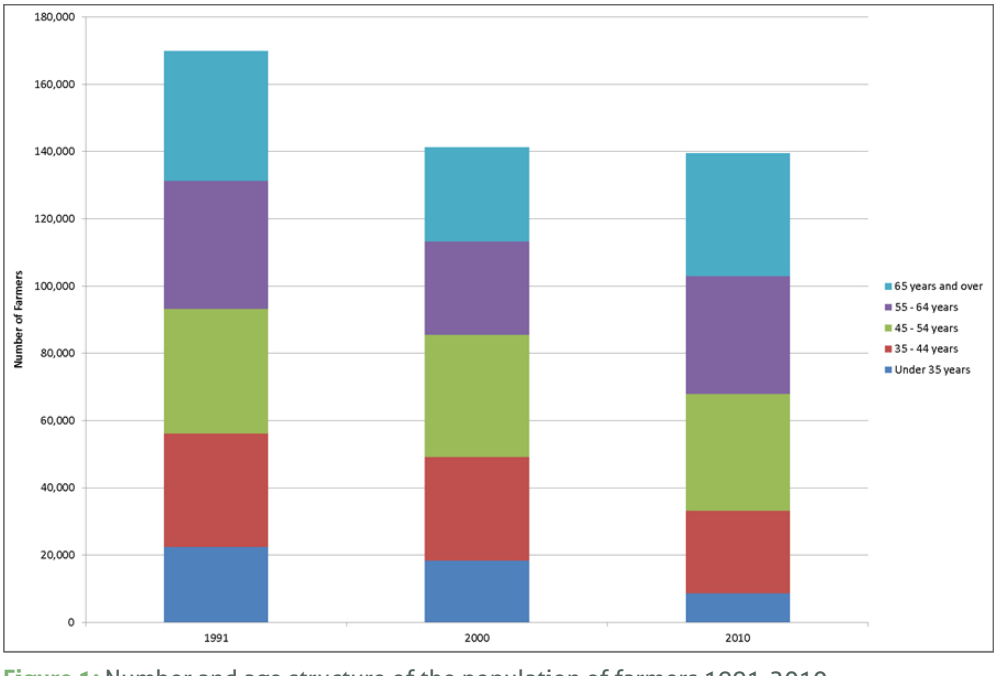

Figure 1: Number and age structure of the population of farmers 1991-2010

Whilst the trend of fewer younger farmers, i.e. those less than 45 years of age, is consistent, the growth of the population of older and elderly, i.e. those over 65 years of age, is particularly pronounced in the period 2000-2010. Nationally, the number of farmers under 35 years more than halved in the 2000-2010 period from 18,382 to 8,683 and, as a share of the total population, this group declined from 13% to 6% of all farmers (CSO, 2017). Declines were also recorded in the number of farmers between 35-44 years (-25%) and 45-55 years (-5%). Counterbalancing these developments was the increase during the same period in the number of farmers between 55 and 64 years by 21% or an additional 7,253 persons, with further growth of 8,596 in the number of farmers over 65, representing 23% growth over 10 years.

Mapping the distribution of the population of elderly farmers in 2000 and 2010 facilitates a comparative analysis of the spatial impacts of these developments (Figures 2 and 3). With the class breaks on both maps held constant, it is immediately obvious that the population of farmers over 65 years of age has increased, as a percentage of the total population, particularly in western and upland areas. However, other areas have also experienced a similar trend. The general pattern of ED's progressing from lower to higher values over time highlights the progressive ageing of the population of farmers in most places. That the pattern is more pronounced in western and upland areas is a reflection of the already high values associated with EDs in these places at the time of the Census of Agriculture in 2000. It also points to an apparent lack of farm succession resulting in the recruitment of young farmers, i.e. succession may have happened but the incoming farmer was relatively old. In part, this may be explained by the fact that, in line with the general population, life expectancy amongst farmers has increased. As farmers live longer, it is possible that succession occurs later and, consequently, the successor is older. However, this does not explain why the percentage of elderly farmers is substantially higher in some areas and why there are relatively few younger farmers. In order to begin answering this question, we develop a geo-demographic typology of EDs.

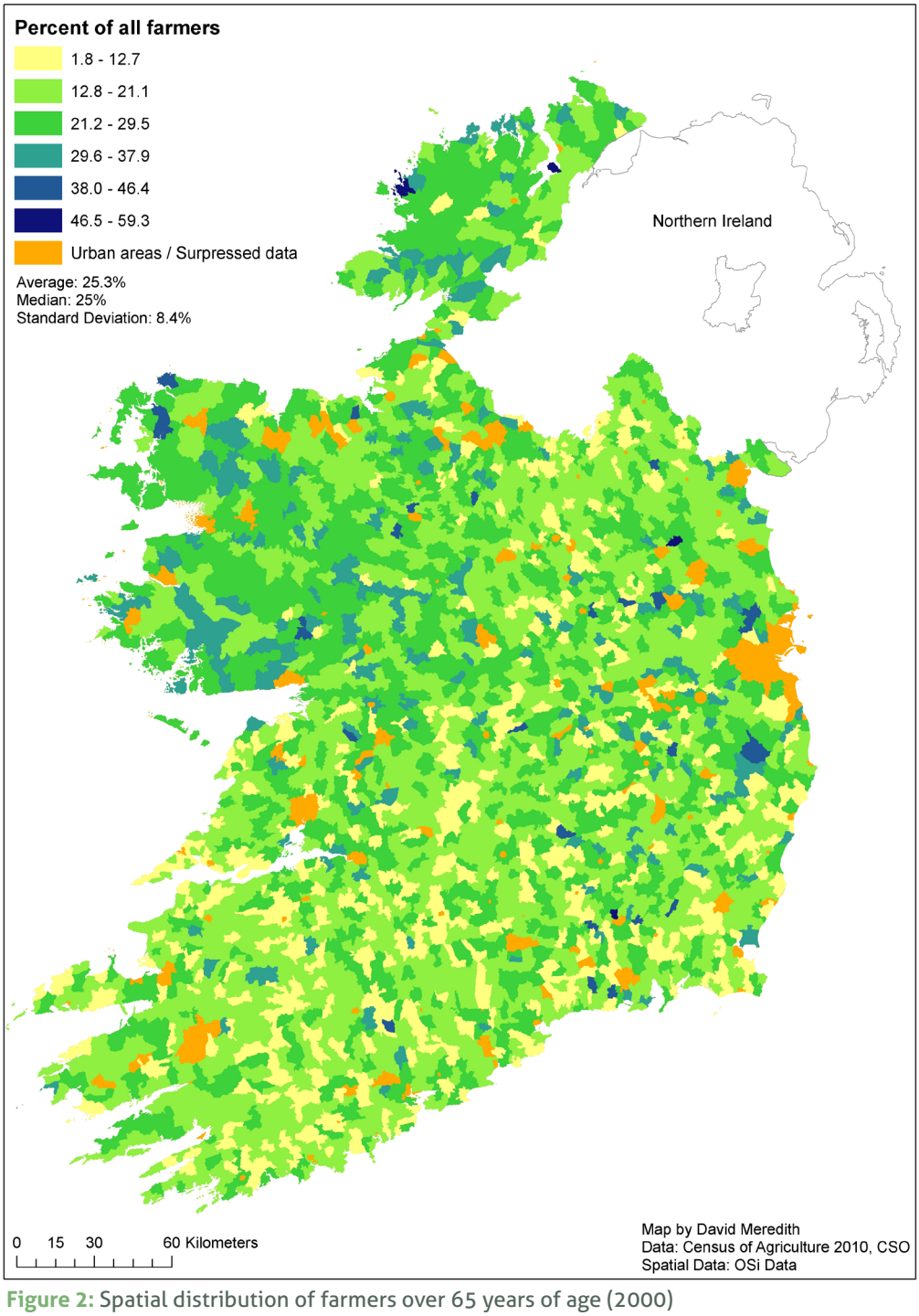

Figure 2: Spatial distribution of farmers over 65 years of age (2000)

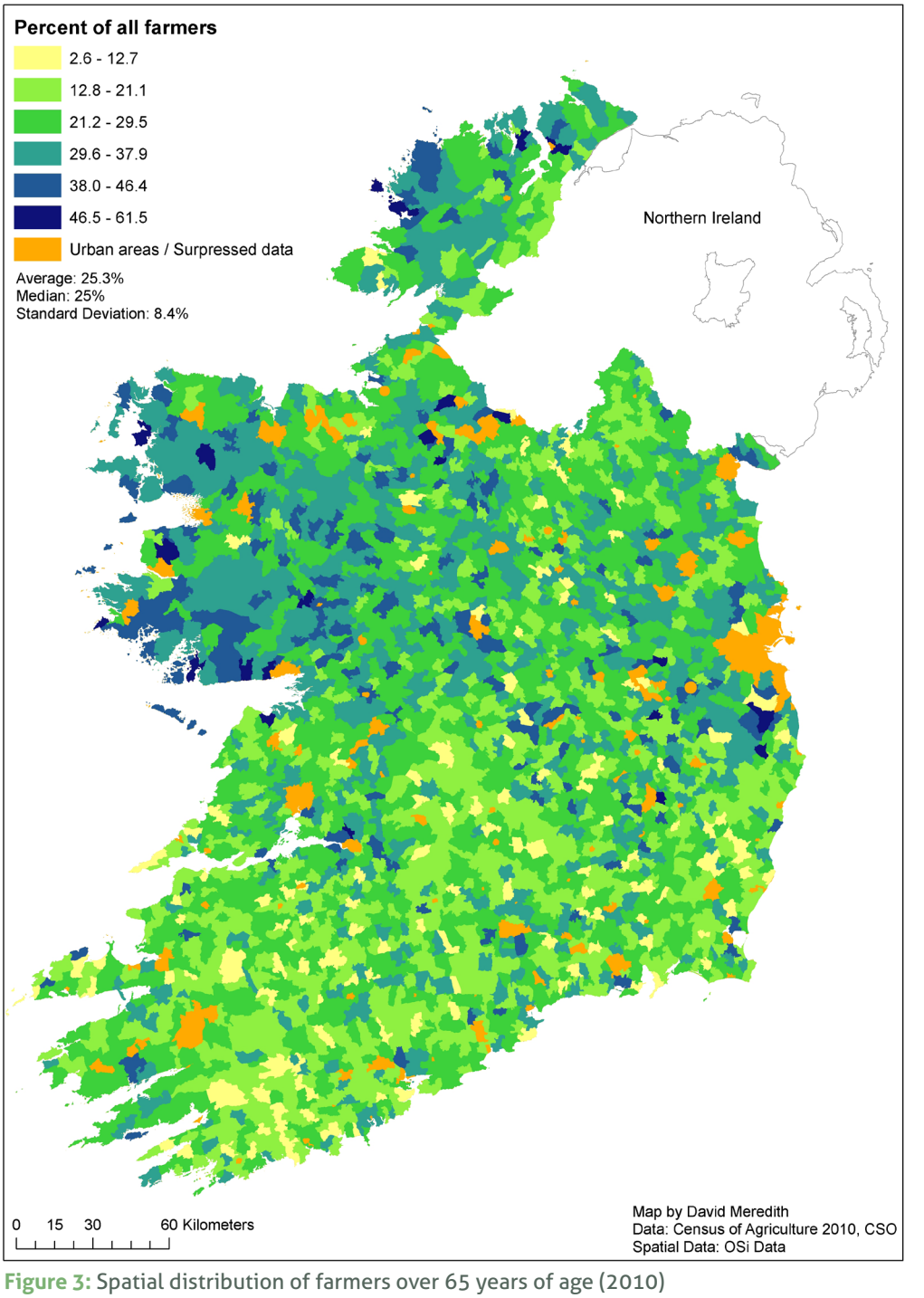

Figure 3: Spatial distribution of farmers over 65 years of age (2010)

4. The evolution of the geo-demographic structure of Ireland's population of farmers 2000-2010

Whereas the extant research utilising census of agriculture data has, predominantly, focused on exploring changes to the spatial structure of farm enterprises and systems, the analysis presented below considers the geo-demographics of farming. Drawing on the 2010 Census of Agriculture, we develop a spatial typology of EDs based on the percentage of farmers over 65 years of age. We then consider the extent of changes to this typology between 2000 and 2010 before exploring the characteristics of enterprises in areas with higher and lower percentages of elderly farmers. The data used in this assessment are briefly considered below.

The 2010 census differed from previous censuses as, for the first time, it combined administrative records relating to cattle numbers and area of crops with paper questionnaires. Previous to this, censuses were based on the collection of data via a survey of farms. The questionnaires, the completion of which is mandatory, were sent to all farm holdings greater than one hectare and all intensive pig or poultry producers. There were, in addition to the change in how the census was compiled, important changes relating to the composition of individual variables published in the 2010 census. Of greatest significance to this research were changes impacting on the allocation of farms to enterprise types, e.g. dairy, beef, tillage, sheep. The economic scale of farming and the relative importance of different enterprises that comprise the farm business are assessed by calculating the total Standard Output (SO) produced by each enterprise, e.g. beef and tillage, associated with the farm. The SO is not a measure of farm income as it excludes 'account costs, direct payments (such as the Single Farm Payment); value added tax or taxes on products' (CSO, 2012, p.100). The SO is calculated for every farm by applying a coefficient for each product produced by the farm, e.g. ewe, dairy cow, that is 'determined on the basis of a standard 12-month production period and is calculated as a regional average', i.e. the Southern-Eastern and Border, Midland, Western administrative regions (CSO, 2012, p.103). Farms are subsequently allocated to one of eight 'types': Specialist Beef, Specialist Sheep, Specialist Tillage, Specialist Dairy, Mixed Grazing Livestock, Mixed Crops and Livestock, Mixed Field Crops and Other, depending on the relative contribution of the different enterprises to the total farm SO. This measure of economic scale replaced the estimate of Standard Gross Margin (SGM) that was used in previous censuses to measure the economic scale of a farm. As a consequence of this change, direct comparisons cannot be made between the economic size of farms in the 2010 census and the economic size of farms published for earlier years. Furthermore, it is not possible to provide a direct comparison of, for example, the number of Specialist Beef or Specialist Dairy farms, between the 2010 census and previous censuses.

4.1 A geo-demographic typology of farmers

Out of a total of 3,409 EDs, the CSO provided data from the 2010 census for 2,828. The equivalent figure from the 2000 census was 2,868 EDs. Due to differences in which EDs are included in the 2000 and 2010 datasets, only 2,772 are directly comparable, i.e. there is data for both 2000 and 2010. Those EDs with no agricultural activity, N=487, were excluded whilst a further 144 EDs where there were fewer than 10 farms in the 2010 Census of Agriculture were also excluded to preserve the confidentiality of the respondents. Unsurprisingly, most of these EDs are associated with urban areas, i.e. towns, cities and suburbs (Figure 4). Finally, 37 EDs were excluded on the basis that they were missing data for either 2000 or 2010.

The 2,772 EDs used in this analysis were allocated to six classes ranging from 'Very Low' percentages of farmers over 65 years of age, to 'Very High' relative to the national average of 25%. We use the Standard Deviation classification method within ArcView 10 to determine which EDs are associated with each category (Figure 4). This has a number of advantages over other classification options: namely, it visualises differences between EDs based on their distance from the average value (25%) using the standard deviation of 8.4%. In doing so, it enables us to distinguish between EDs that are close to the average and those with more extreme values. The drawback of this approach is the substantial variation in the number of EDs allocated to each class, e.g. 194 EDs are classified as having 'High' or 'Very High' percentages of the elderly farmer population farmers whilst 1,049 are in the 'Average' class (Table 1).

Applying a statistical approach to the identification of the classes highlights broad regional differences with EDs in the south and east of the country generally recording lower than average percentages of farmers over 65 years of age whilst those in the north and west have higher values (Figure 4). There are local variations to this pattern, which are not obvious in the assessments presented in Figures 2 and 3, with some EDs in the west recording lower values, e.g. those around Castlebar, Westport and Letterkenny whilst others, in the east, record higher values, e.g. around Dublin and the Wicklow, Blackstairs and Cooley mountains. Lafferty *et al.,* 1999 highlighted similar patterns in the 1990 data, raising the question of whether the older age profile in some places is a structural feature of farm enterprises, i.e. farm succession happens relatively late in life. We explore this issue by way of comparison of the change in the number of EDs in each category in 2000 and 2010 (Table 2).

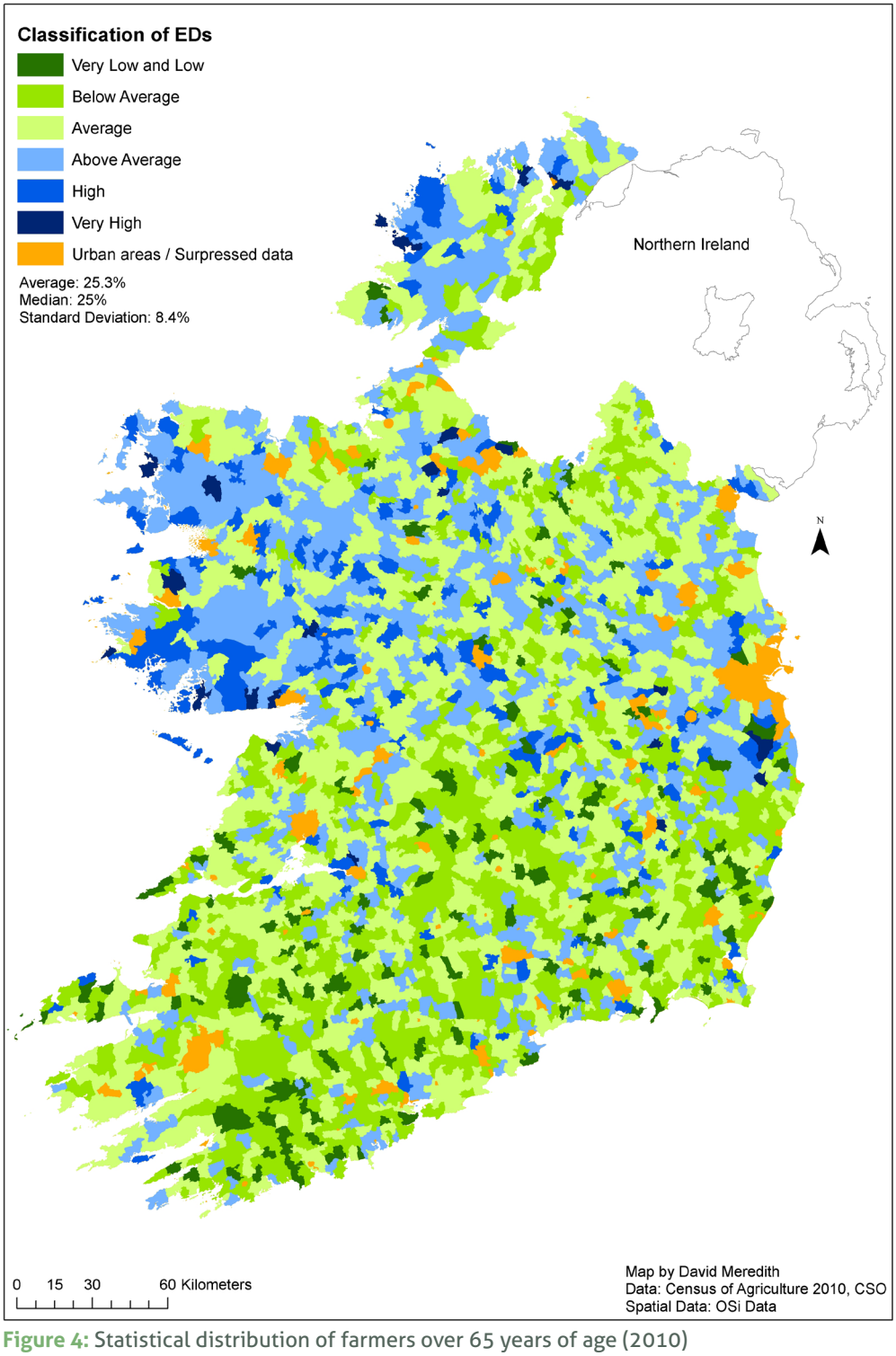

Figure 4: Statistical distribution of farmers over 65 years of age (2010)

Table 1: Elderly farmer ED typology: Number of farms (2010)

	Low and Very Low	Below Average	Average	Above Average	High	Very High
Number of EDs	160	719	1,049	652	170	24
Number of Farmers	5,866	31,623	54,263	35,763	9,206	1,097

CSO, 2012. Census of Agriculture 2010. Small Area Statistics. Author's calculations

The analysis reflects change in the size and distribution of the population of farmers over 65 years of age. Whereas there were 28,043 older farmers in 2000, this population had grown to 36,639 by 2010, an increase of 31% (CSO, 2017). The number of farmers less than 55 years of age fell by 26% over the same period. In the face of this development, it is unsurprising that the number of EDs associated with below average percentages of older farmers fell, e.g. whereas there were 489 EDs classified as having a low level of this population in 2000, the equivalent figure in 2010 was 160. The disaggregation of this change indicates that whilst 66 EDs remained in the 'Low' or 'Very Low' category, 49 transitioned into the Below Average, Average, Above Average and High categories. This reflects a general trend, i.e. fewer EDs below average and more EDs in the average and above classes (Figure 2). Decomposing the changes identifies that not all EDs experienced the ageing trend; some experienced the opposite development, e.g. 27 EDs that were in the Average class in 2000 were allocated to the Low category in 2010. This trend is thought to reflect the farm succession process, i.e. natural decrease in the elderly population of farmers combined with inheritance of farms by younger farmers. These developments may also have been affected by changes in how the CSO associate farms to places in the 2010 Census of Agriculture; from the location of farm headquarters to the location of the largest proportion of land of the holding.

Table 2: Change in allocation of EDs within the geo-demographic typology: 2000-2010

		Electoral Division Classification 2000						
		Very Low and Low	Below Average	Average	Above Average	High	Very High	Number of EDs (2010)
Electoral Division Classification 2010	**Very Low and Low**	66	61	27	3	3		160
	Below Average	197	335	165	19	3		719
	Average	157	504	331	50	5	2	1,049
	Above Average	55	240	269	74	13	1	652
	High	14	42	81	31	1	1	170
	Very High		6	12	6			24
	Number of EDs (2000)	**489**	**1,188**	**885**	**183**	**25**	**4**	**2,774**

CSO, 2012. Census of Agriculture 2010. Small Area Statistics. Author's calculations

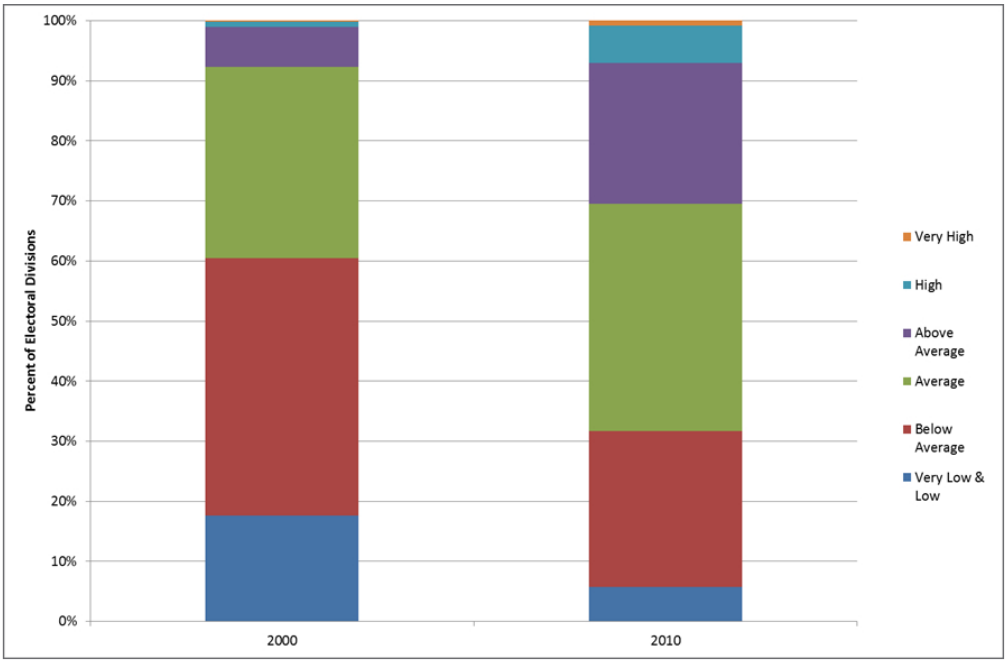

Figure 5: Demographic Typology 2000 and 2010: Change in the distribution of EDs

CSO, 2012. Census of Agriculture 2010. Small Area Statistics. Author's calculations

The geo-demographics of farm enterprise distribution

Gilmore (1999, p.82), writing about the Early Farmer Retirement Scheme, noted that in the 'southern dairying region farms are of medium to large size and there is a strong commercial orientation towards farming. The future prospects for agriculture seem better than in many places and there is a substantial number of qualified transferees prepared to farm on a fulltime basis. The large and constant amount of work associated with dairying is an incentive for some older farmers to retire. There has been a stronger tradition of lifetime transfer of farms than elsewhere in the country.' Explicit in this assessment is the crucial role that the economic scale of the farm enterprise plays in facilitating the earlier transfer, i.e. during their lifetime, of the farm from the farmer to the successor. In practice, the farm enterprise has to have the capacity to support, or contribute substantially towards doing so, not only the successor and their household but also the retiring household. Farm enterprises that are larger, more intensive or specialise in certain activities from which there are, generally, positive market returns have the capacity to generate the income necessary to make farm succession economically attractive to both the retiring farmer and the person who inherits the farm business. The ability of the farm to generate an income that will support or contribute towards supporting the lifestyle of the successor, a point reflected on by Crowley *et al.* (2008), Shortall (2017) and Cassidy (2017), is a significant issue.

The National Farm Survey, undertaken annually by Teagasc, has consistently found that dry stock enterprises, i.e. beef and sheep producers, record very low or negative returns. Agricultural returns associated with the vast majority of those enterprises come almost entirely from the Single Farm Payment and other policy related payments. In 2016, policy related payments accounted for 115% of income on cattle rearing enterprises and 114% on sheep enterprises, the fact that these figures are greater than 100% points to the unprofitability of most enterprises in these categories (Dillon *et al.,* 2017). Conversely, dairy and, to a lesser extent, tillage enterprises generate income from selling their produce, i.e. 85% of farm income to tillage enterprises was associated with policy related payments whilst the equivalent figure for dairy enterprises was 36%. The disparity in dependence on policy related payments reflects the underlying economics of the different types of enterprise, e.g. whilst a dairy enterprise generates, on average, €52,155 in farm income, the equivalent figure for cattle rearing enterprises was €12,516 (Dillon *et al.,* 2017). These differences are significant due to the geographic specialisation or clustering of farm enterprises in Ireland and, consequently, the economic capacity of farms in different places to support, or not, lifetime transfer of farm businesses (Meredith and Crowley, 2014). In other words, they impact on the timing of succession and, consequently, the demographic structure of the population of farmers.

The spatial distributions of specialist sheep, beef, tillage and dairy depicted in Figures 6-9 reflect those found by Lafferty *et al.* (1999) and Crowley *et al.* (2008) for the 1991 and 2000 censuses of agriculture respectively. Using location quotients, we assess these distributions at the time of the 2010 census of agriculture; EDs with a value greater than 1 correspond to those where there is an above average proportion of a given enterprise compared to the national average, e.g. a value of 1.2 corresponds to 20% greater than the national average number of specialist beef enterprises. The maps highlight the spatial concentration of specialist sheep enterprises in, generally, upland areas and specialist beef enterprises in marginal agricultural areas, i.e. where soils tend to be heavy or less well drained. In contrast to this, specialist dairy enterprises are predominantly concentrated in Munster with locally significant pockets in the Foyle Valley, Cavan-Monaghan and along the east coast. Tillage enterprises are highly concentrated in the east and southeast with locally significant pockets elsewhere, e.g. the Foyle Valley. These distributions suggest that there is an association between the type of farming and the age structure of the population of farmers in a given area.

A clear trend is evident when we apply the geo-demographic typology to these data (Figure 10). An assessment of the distribution of farm enterprises confirms the association between those areas with lower numbers of elderly farmers and larger numbers of specialist dairy or tillage farms. As we move to areas with higher percentages of elderly farmers, the percentage of specialist dairy or tillage farms declines and the percentage of specialist beef and, particularly, sheep farms increases. These differences are also reflected in the economic scale of enterprises in each area. More than 70% of the 1,097 farms in EDs classified as having a 'Very High' percentage of elderly farmers are estimated to have a SO of less than €8,000 whereas the equivalent figure in 'Average' EDs is just over 40% and less than 30% in EDs classified as 'Low' (Figure 11).

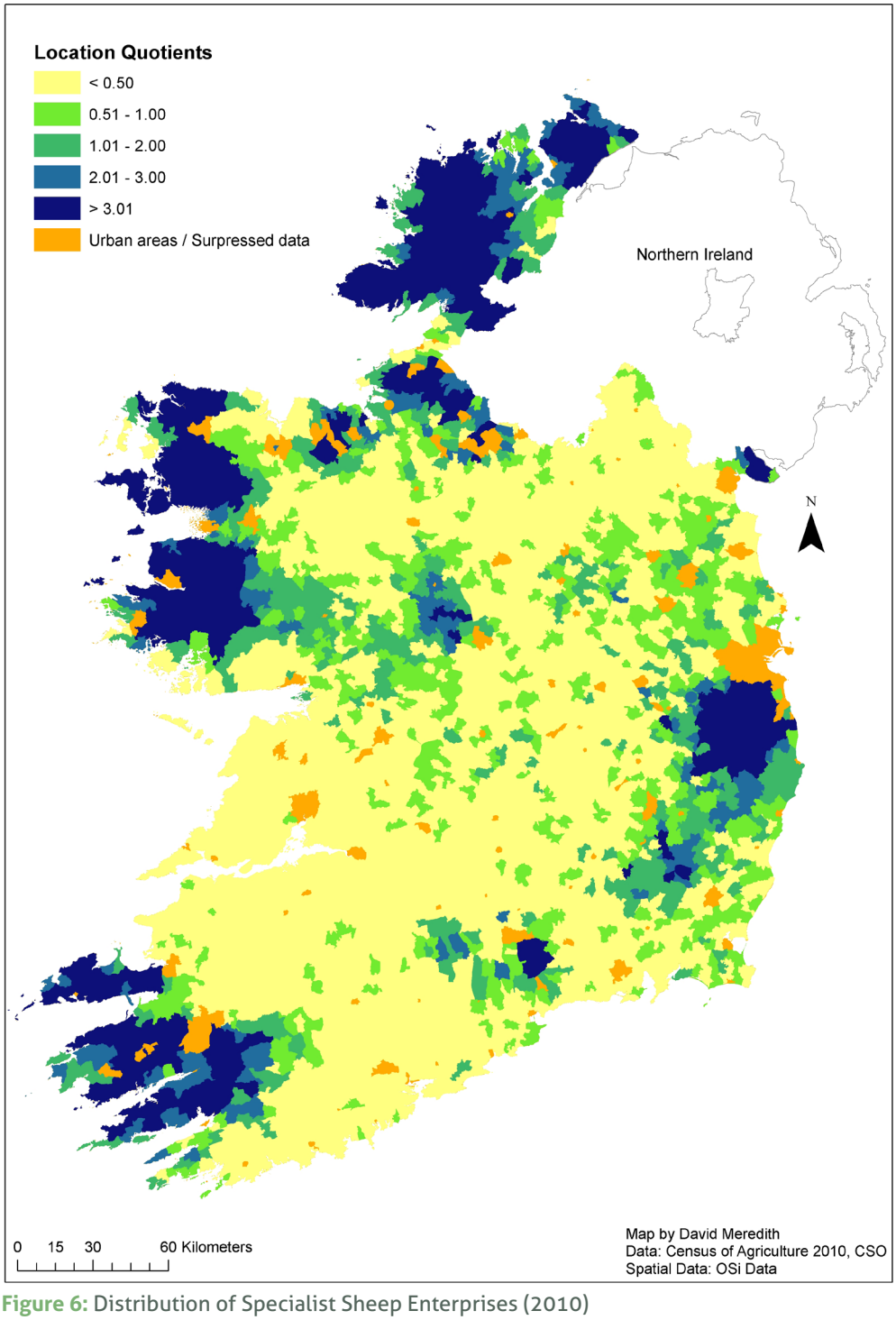

Figure 6: Distribution of Specialist Sheep Enterprises (2010)

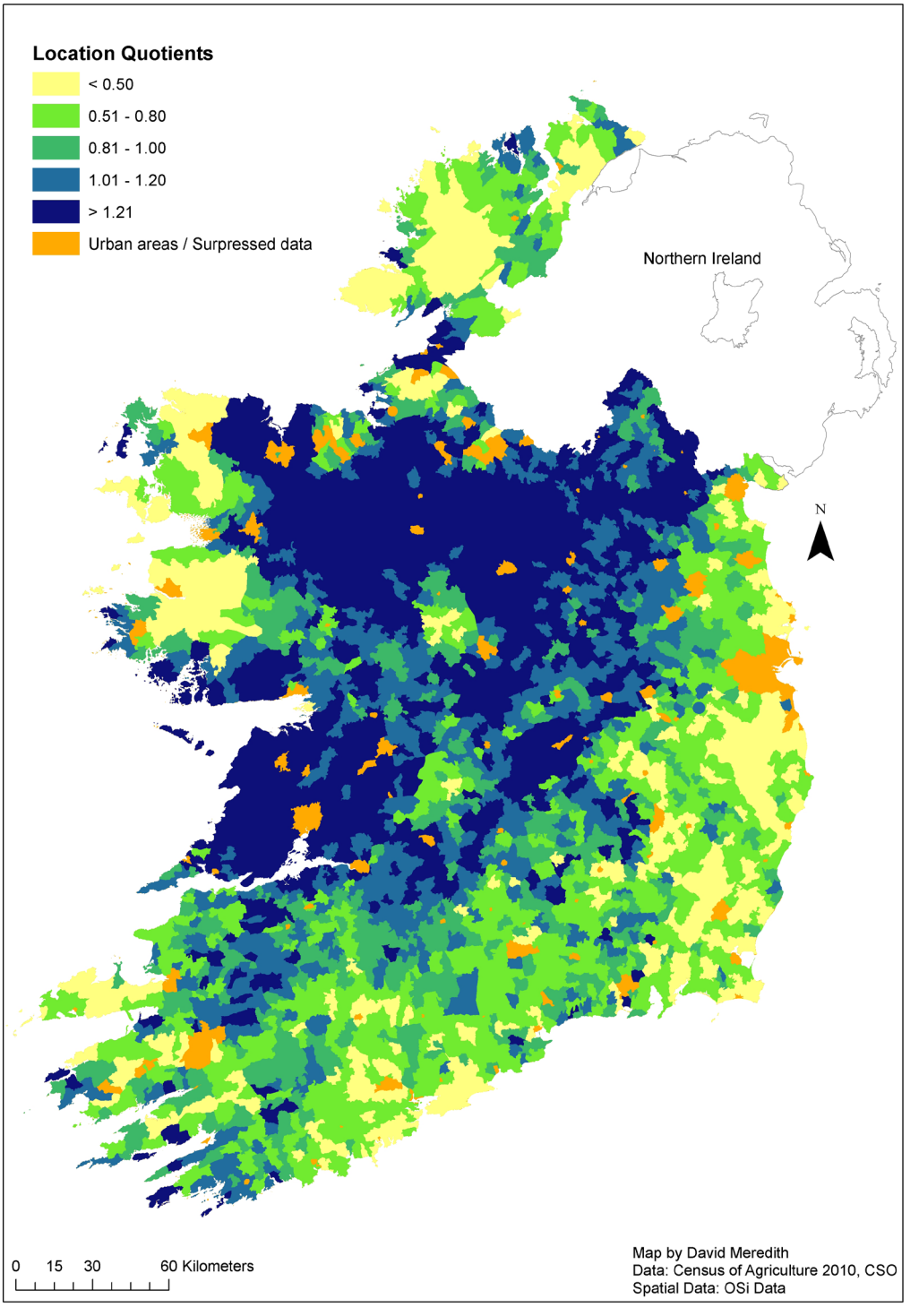

Figure 7: Distribution of Specialist Beef Enterprises (2010)

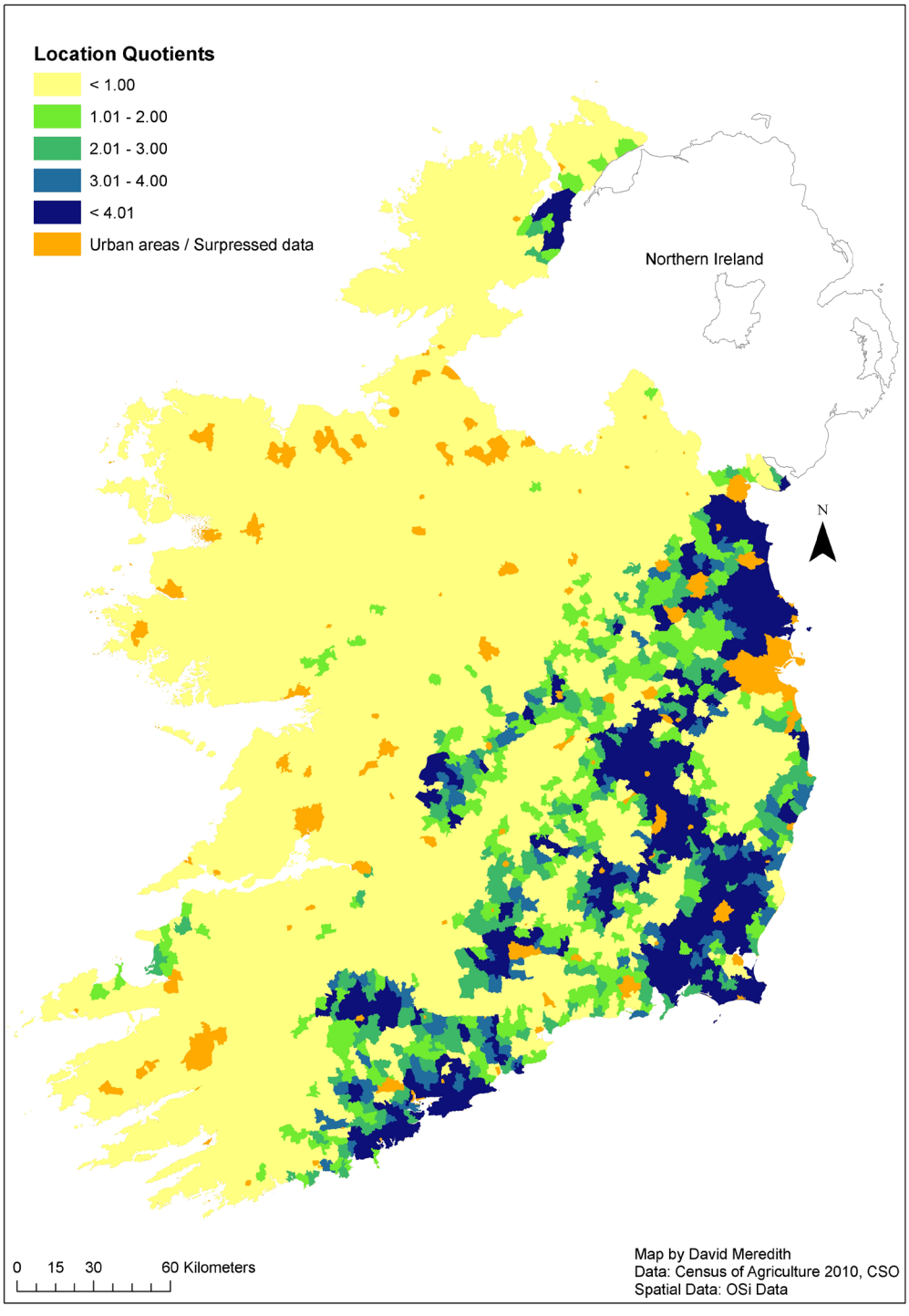

Figure 8: Distribution of Specialist Tillage Enterprises (2010)

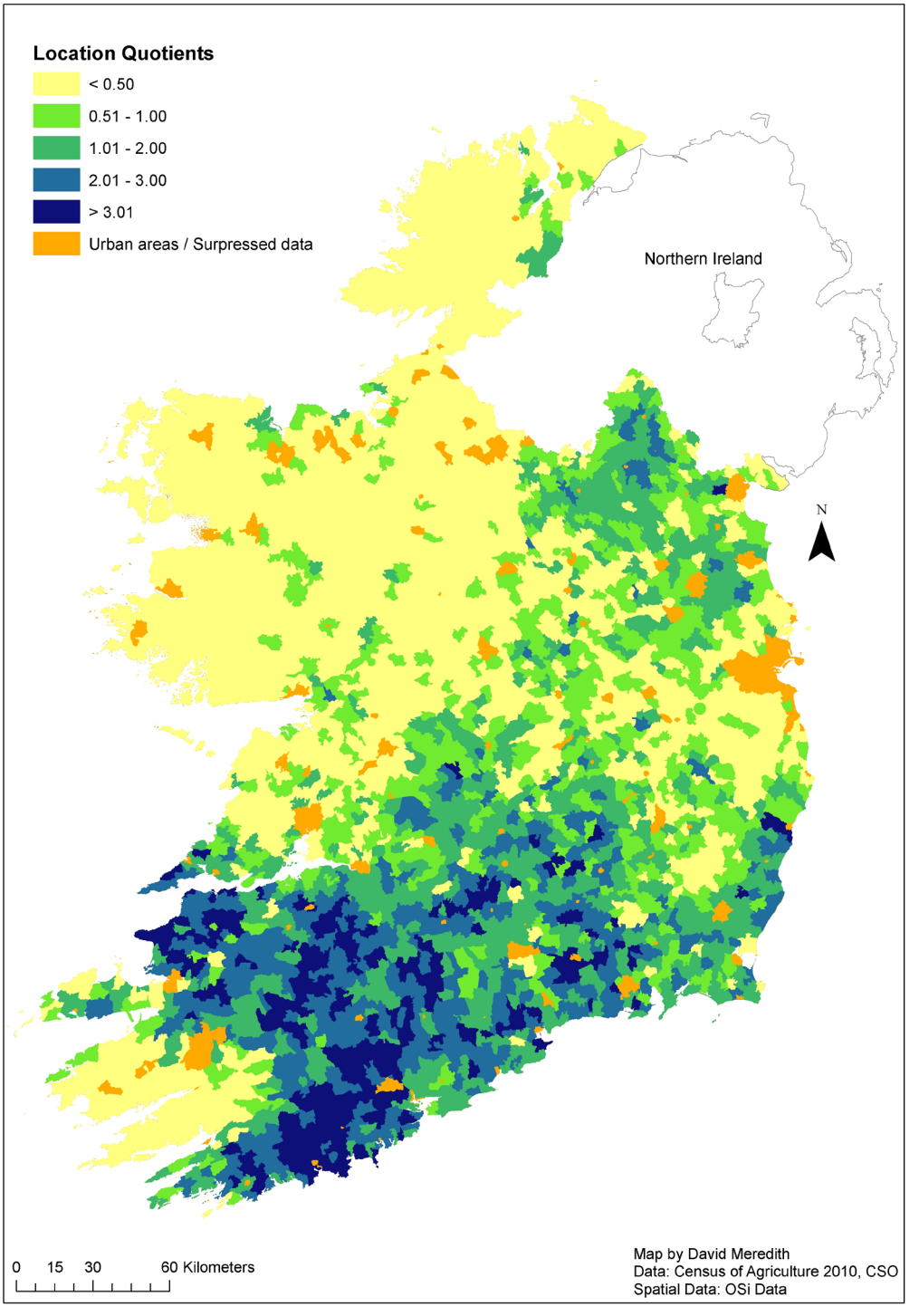

Figure 9: Distribution of Specialist Dairy Enterprises (2010)

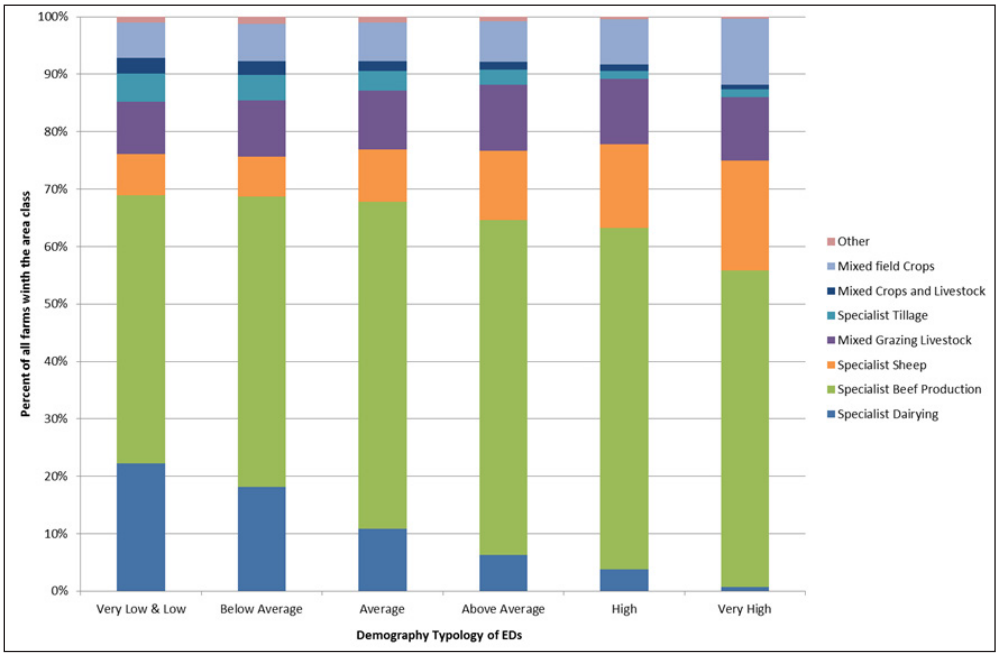

Figure 10: Distribution of types of farm enterprise (2010)

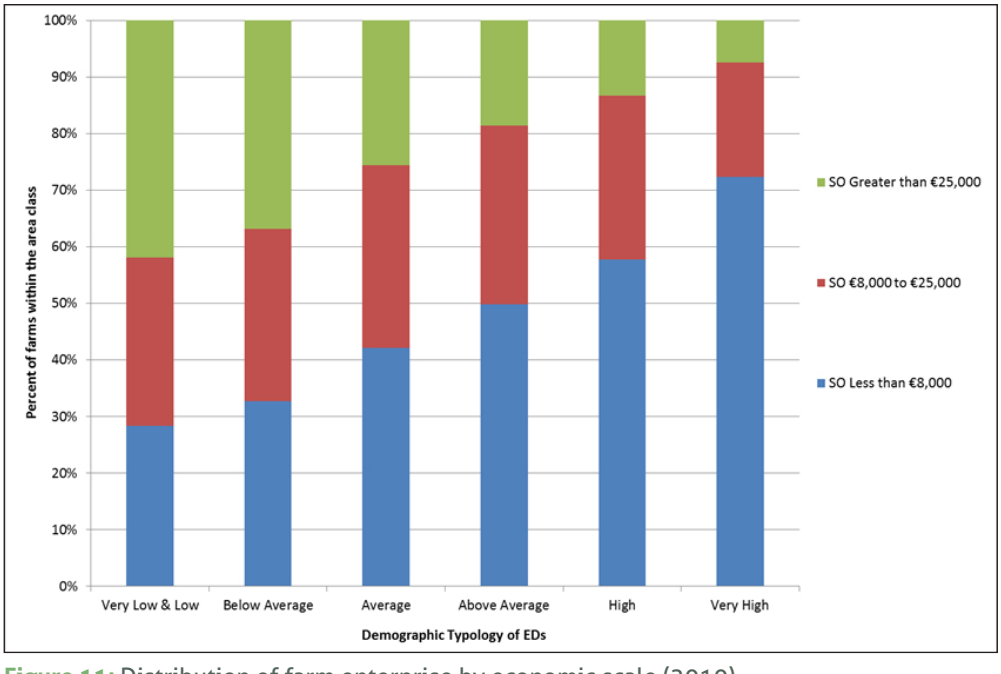

Figure 11: Distribution of farm enterprise by economic scale (2010)

It is evident from our assessment that the geo-demographic profile of the population of farmers in Ireland is an important factor in the processes and outcomes associated with the geographic sorting of farm enterprises. The latter is explained by Crowley *et al.* (2008) as the interaction between enterprise type, location and structures, on the one hand, and agri-governance systems on the other. Changes to the CAP, in particular, have exposed farm businesses to market forces and commodity price volatility which are driving increasing economies of scale and, consequently, the need to improve productivity through greater levels of specialisation and intensification, e.g. investment in acquiring more land, animals or technology. The small size and economic scale of many farm enterprises limits their capacity to generate sufficient income to justify or pay for additional farm investment. The absence of farm investment is another factor that reduces potential farm successors' willingness to take over the farm business (Calus *et al.,* 2008).

Whilst the interaction between the financial viability of different types of farm enterprises largely explains the association between the demographic structure of the population of farmers and geographic specialisation of farm enterprises, this is not the only issue affecting succession. Other factors are also important; there may be a reluctance to 'burden' the next generation with an asset that, whilst valuable, does not and perhaps cannot generate a sufficient income to meet contemporary lifestyle expectations (Bogue, 2013; Cassidy and McGrath, 2014). In such instances, there are a variety of options, e.g. sale of the farm, entering long-term leasing arrangements, developing formal partnerships with another farmer, development of an alternative or diversified farm enterprise and afforestation (Russell, 2015). Many of these options have long been rejected by farmers and farm households, e.g. the sale of the farm, diversification and afforestation. Other options have been embraced, e.g. supplementing the farm income through off-farm employment (Meredith, 2011). There is some evidence that off-farm income earned by a spouse may support on-farm investment (Hennessy and O'Brien, 2008). Furthermore, the sale of sites for residential development, i.e. one-off houses, is, in some cases, critical to supporting on-farm investment or the viability of the enterprise (Duffy, 2017). In both instances, these opportunities for generating additional income are spatially constrained through accessibility to employment opportunities and demand for housing in the countryside. Research by Keaveney (2009) identifies hot-spots of 'one-off' housing in the countryside that are proximal or accessible to larger urban centres or in high amenity value locations where there is demand for holiday homes. Similarly, employment opportunities are spatially constrained with most employment located in or near urban centres (Meredith, 2012). Given Ireland's urban structure, with larger towns and the cities predominantly located in the south and east of the country, both of these opportunities are, generally, spatially contiguous with more commercially viable farm enterprises. Many marginal farm enterprises are concentrated in regions where equivalent opportunities are not available to the same degree, e.g. there is less demand for sites, the farm is so small that the sale of sites is not feasible, or the sale of sites does not generate sufficient income to facilitate further on-farm investment.

With regard to off-farm employment, the absence of formal qualifications, relatively low levels of education amongst many farmers and the need to be close to the farm can limit employment options meaning that the return from working off-farm are relatively low. Alternative farm income generation or farm diversification, e.g. artisan food production, agri-tourism or other uses of farm resources, which are supported through the CAP, remain niche activities due to the requirement to have the human and capital resources required to successfully develop such an enterprise.

The future of farming in Ireland

Whilst traditionally farm households have, in general, rejected a number of options with respect to the development of the farm, e.g. diversification, afforestation and, particularly, sale of the farm assets, especially land, the economic challenges facing many farms combined with changing social and cultural norms are opening up a number of these possibilities. Research by Bogue (2013) established that many parents do not encourage their children to consider farming as a career, preferring that the potential heirs come to that decision themselves. This perspective is informed by the realities of farming for many, i.e. a physically demanding, time-consuming job that generates little income. Notwithstanding this view, most farm households desire that an heir will take over the running of the farm and, in doing so, retain the farm within the family (Bogue, 2013). This research is important as it highlights the views of the current generation of land-holders and their perspectives, regarding what they think should be happening to the farm. Relatively little research has been undertaken regarding the perspectives of potential successors in relation to farming and land use (Cassidy and McGrath, 2014). As part of a Department of Agriculture funded study into the functioning of agricultural land markets in Ireland, a survey of potential successors was undertaken in 2015. The objectives of this research were to assess the attitudes of young farmers and potential farmers towards farming and land use. The questionnaire was implemented online, via SurveyMonkey and fully completed by 60 individuals. The small sample, whilst sufficient for the purpose of piloting the survey instrument, means that the data presented here are not and cannot be considered representative of the views of potential successors; rather they are indicative of the range of views held by those who completed the survey. Whilst the survey covered a range of topics and issues, we focus here on a number of attitudinal questions and the respondents' views regarding land use/land management.

The respondents had an average age of 32 and were predominantly male (70%). Many, 45%, were working fulltime off of the farm whilst 23% were in fulltime education, 20% were combining off-farm and on-farm work and 7% were working fulltime on a farm. In terms of the respondent's connection to farming, most, 95%, came from a farm household, i.e. there was a farm in the immediate family, whilst the remaining respondents (n=3) had a family relation with a farm, e.g. uncle, aunt. Geographically, respondents were drawn from all counties in Ireland though there were greater numbers living in Tipperary and Cork. Dairy (30%), mixed livestock (27%), and cattle (22%) enterprises were the

dominant enterprise types operated by the families of those that completed the survey.

In terms of the attitudes of the respondents to farming, 63% agreed with the statement that farming is more a way of life rather than, solely, a business, whilst 23% disagreed with this view. This result is, broadly, in line with the survey of a nationally representative sample of farmers undertaken in 2011 when 75% agreed and 21% disagreed (Meredith *et al.,* 2012). The slight divergence in the results raises the question of whether younger farmers are more commercially oriented than their older peers; further research with a nationally representative sample of younger and older farmers is required to answer this question. Associated with this research question is whether the level of commercial engagement by a farmer or farm household changes over the lifecourse.

There is a recognition amongst respondents that, as an occupation, farming can impinge negatively on their lifestyle with 57% agreeing with the statement that 'farming limits my personal options'. Despite this, 61% of respondents stated that they wished to take on a farm business whilst 23% had mixed feelings about inheriting the family farm and 15% were reluctant to do so. The desire to take on a farm is strongest amongst those associated with tillage (81%) and cattle (62%) enterprises. This result is surprising in light of the persistent challenging economic conditions facing both of these sectors, particularly cattle producers. However, it may be explained with reference to the future plans of the respondents. When asked whether, in the event that they inherited a farm, they would work it on a full or part-time basis, only one person associated with a cattle enterprise thought that they would work on-farm full-time, whilst no one associated with a tillage enterprise expressed this view. The divergence between the desire to farm and the perspective that farming can only be done on a part-time basis may be explained by the possibility that with the right management skills it is feasible to combine off-farm employment with the operation of tillage or cattle enterprises. With regard to dairy enterprises, given the volume of work involved in the day-to-day operation of the farm, this is a much less tenable proposition. Overall, 62% of respondents stated that they were likely to combine off-farm employment with farming activities. This is significant as it suggests that pluri-activity is seen by younger or potential farmers as a strategy that can support the continuation of farming whilst also meeting the needs of both the existing, i.e. the retiring, and new farm households. This, in turn, raises the question as to whether or not the respondents would consider changing the scale or type of farming activities.

In relation to changing the type of production, 43% stated that they would be unlikely to change the enterprise, e.g. switch from beef to dairy production, whilst 32% indicated that changing the enterprise mix was something they were likely to undertake. Associated with this, 35% of respondents indicated that on inheriting the farm, they would focus the farm's activities on a reduced number of enterprises, i.e. they would become more specialised. In this context, it is unsurprising that only 12% of respondents indicated that they would introduce a new farm enterprise. In terms of planting forestry, only 8% of respondents considered this something that they were likely or very likely to do compared to 75% stating that they were unlikely or very unlikely to plant. Respondents indicated that they are unlikely to work for another farmer, farm contractor, or to develop an alternative, on-farm enterprise, e.g. agri-tourism business.

With regard to changing the structure of the farm through land disposal, via sale or renting, options involving land sale, i.e. disposal of the entire farm, sale of an out-farm or a land parcel distant from the home farm and sell sites for housing, are all unlikely to be considered by successors. This perspective is undoubtedly informed by many considerations, i.e. the size of the farm and whether there are fragments or parts of the farm that might be suitable for sale, e.g. areas with road frontage. This issue is also informed by social considerations as well. When asked whether the farming community in their area thinks it is acceptable to sell farm land, 38% of respondents indicated that land sale was acceptable. However, when the question was rephrased and asked in terms of whether their family thought that it was acceptable to sell farm land, 47% stated that it was unacceptable, whilst 28% indicated that farm land sale is acceptable to their family. In this context, it is unsurprising to find that only 15% of respondents disagreed, whilst 60% agreed or strongly agreed, with the statement that it is important to maintain ownership of all of the farm land. These views on retaining ownership of the land point to the continuation of a long-held tenet of farm households and communities in Ireland, that the current generation is a custodian of the land and that they have a duty of care to ensure that the land and farm is passed on to the next generation. When asked the extent to which they agreed or disagreed with the statement that 'It is important to hand on the farm in better condition than I will get it', 85% of respondents either agreed or strongly agreed.

Considering the responses to the survey, it seems, from this preliminary analysis that young or potential farmers hold to the views of older farmers. With regard to farm diversification, afforestation and attitudes to farming, the results presented here are very much in line with those reported by Meredith *et al.* (2012), Howley *et al.* (2011) and McDonagh *et al.* (2010). A significant limitation of the data presented above is the lack of representativeness. However, these data provide valuable insights that can inform future research into issues of generational change and land use change, or, as it appears, lack thereof. This is an area of research that is of growing public significance as emphasis is placed on the role that farms can play in mitigating the impacts of climate change through land management and afforestation.

Conclusions

This paper developed a context to situate the papers that are part of this special issue of *Irish Geography* by utilising data from the 2010 Census of Agriculture (CSO, 2012) to describe the geography of farm enterprises in Ireland. In doing so, we developed a geo-demographic perspective, highlighting the association between the age structure of the population of farmers, farm structures and enterprises, and the processes or outcomes of geographic specialisation. The assessment of changes to the demographic structure of the population of farmers between 2000 and 2010 highlighted the extent to which it is increasingly characterised by large numbers of farmers over 65 years of age. Whilst the ageing process has affected all parts of Ireland, it is particularly evident in western and

upland areas. The development and application of a geo-demographic typology of EDs highlights the association between ageing of the population of farmers and the outcomes to processes, resulting in the geographic sorting of farm enterprises.

The intersection of farm structures, economic viability of farm enterprises and farm succession processes were described before considering the attitudes of a small sample of young farmers. These were found to be consistent with representative surveys of the national population of farmers with respect to their views on farming, land use, diversification and afforestation. The continuing attachment to land and perspective of farmers as custodians of the land asset for future generations persists amongst this younger generation. It is notable that the views of these potential farmers are grounded in the realities of contemporary farming; the viability of farms as social and economic units is forefront in the perspectives of young farmers and, related to this, the need to engage in off-farm employment. This highlights an on-going challenge in Ireland, namely the need for rural economic development leading to job creation. Whilst investment in transportation infrastructure has undoubtedly increased access to urban job centres, there are extensive areas that are inaccessible to these places. The rural-urban digital divide in terms of access to high-speed broadband further disadvantages rural economic development.

The significance of marginal farming areas is, in the context of expansion of the dairy sector following the removal of milk quotas in 2015 and consequent increases in GHG emissions from agriculture, changing how they are viewed as potential locations for large-scale afforestation (Schulte *et al.,* 2013 and 2014). Whilst this may reflect a logical view of potential land uses, it is problematic, not least because farmers are the land-holders and any change in land use is subject to their willingness to do so. The findings from the survey of potential future farmers highlights that younger farmers are, like their older peers, resistant to afforestation. Furthermore, as Schulte *et al.* (2014) acknowledge, demand for land may result not only in the need for compromise between agronomic and environmental objectives, but also between individual environmental objectives, i.e. between the conservation of high nature value farmland which is fundamental to the development of rural tourism, e.g. the Wild Atlantic Way, and afforestation (Kelly, 2016). The growing significance of environmental concerns, particularly those where Ireland faces financial penalties for failure to meet agreed targets, e.g. water quality and GHG emissions, will inevitably result in greater public scrutiny of land use in Ireland. In this context, it is therefore unsurprising to find a recommendation within the draft National Planning Framework for a national land use policy.

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