

KEEPING THE NAME ON THE LAND:
THE FAMILY FARM AND ITS
SURVIVAL THROUGH PERIODS OF
POSTWAR AGRICULTURAL
CHANGE

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Acknowledgements

This PhD is based a period of fieldwork at a single family farm in Ceredigion, Wales. This farm has been given the pseudonym 'Fferm Ysgawen' in this thesis, which refers to an occasion where I sent out on a sunny afternoon to pick "some good, you know" branches of elderflower to make homemade champagne. This shows how the family of Fferm Ysgawen spent time involving me in their daily lives and celebrations, teaching me about farm work, encouraging me to learn Welsh and introducing me to others as "the student". The family farm was the perfect context for this PhD and the themes that it explores – internal dynamics, technology, external connections and an intense longing to keep the family name on the land. I hope you can hear *their* story resonate through the pages. On a personal level, fieldwork at Fferm Ysgawen was one of the most challenging (farm work is tough, for a "townie") yet enjoyable and intensely rewarding times. There's little more I can say except "Diolch yn fawr Fferm Ysgawen".

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ABSTRACT

This PhD is about the family farm in the United Kingdom. It investigates the reasons behind their survival since the end of World War Two and the current day. The research is situated in a gap in knowledge within agricultural geography that exists due to an inadequacy to explore effectively the family farm and its continuation. This is related to two strands of research. First, analysts of the era between the mid-1940s and early-mid 1980s argued that the inability of the family farm to access funding through external connections to fund technology would result in their extinction. Second, activities such as farm diversification, which have been suggested by proponents of agricultural phases since the early-mid 1980s such as 'post-productivism', have failed to provide real options for family farmers to survive without food production.

This PhD acknowledges the role of the family farm itself, technology and external connections to its persistence. It creates a theoretical framework grounded in an appreciation of the everyday and mundane, which justifies concentration on a single family farm located in Ceredigion, Wales, UK. The study implemented ethnography and multi-sited ethnography by living and working on a family farm and using the complementary methods of participant observation, focused discussions and in-the-field interviewing. The study found that family farmers utilise their own creativity, resources and abilities to engage with technology and external connections in diverse, multiple and unexpected ways. These practices were related to motivations such as maintaining a good way of life, producing food and supporting the local community. In turn, these motivations were connected to a deeply embedded emotional longing to survive and keep the name on the land.

CHAPTER 1: INTRODUCTION

Family farming is a significant element of the appearance of the countryside, food and agricultural sector, and culture of the United Kingdom. The most recent data available from DEFRA (2013) records that the total utilised agricultural area (UAA) of the UK is 17.3 million hectares. This means that with the total area of the UK standing at 243,610 agricultural land use amounts to 71%¹. Agricultural geographers have discussed that family farms are responsible for most of the farming activity on this land (Lobley *et al.*, 2010; Gasson *et al.*, 1988). Indeed, survey work has found that the percentage of agricultural land operated by family farms may be as much as 86% in some areas of England (Lobley *et al.*, 2010). Gasson *et al.* (1988, p.1) state that 'the great majority of UK farms are run as family businesses'.

This ownership of a substantial amount of UK land means that family farming makes an important economic and productive contribution to the agricultural sector. Brookfield and Parsons (2007; preface xiii) argue that family farmers 'have a central place in very large economic sectors'.

Agricultural geographers have conceptualised family farms as important forms of labour relations and decision-making units. More recently, they have considered the role of family farming in the culture of the UK. As Lobley *et al.* (2010, p.49) write, 'family farming remains of totemic importance'. For example, Morris and Evans (2004) highlight the presence of family farming in perceptions of the countryside, television and radio productions such as 'The Archers' and 'Countryfile', and our knowledge of where food comes from. In 2013, these perceptions were challenged by the

¹ This calculation has been made by converting 17.3 million hectares into kilometres, which equals 173000km². The total area of the UK is 243610km², which means that 71% is used for agriculture.

emergence of a scandal, where meat sold as beef within packaged products such as lasagne and burgers was actually found to be horse meat. Frantic attempts to find the reasons behind this miss-selling led to the realisation that the food system is a highly complex global network of production, process and supply where fraud could be hidden (Roe, 2013). In response, media publications have observed that some consumers have changed their shopping practices to buy food produced and sold from what they believe are local family-run businesses including butchers, farm shops and farms (BBC, 2013; Guardian, 2013). Organisations such as The Countryside Restoration Trust (2013; my emphasis) have emphasised the particular role of the family farm in providing verifiable meat: 'The CRT [Countryside Restoration Trust] is working to sustain a living, working countryside where *family farmers* supply local markets and shops which shoppers and their families can trust'. This research is situated within this context of agriculture and the sub-discipline of agricultural geography. More specifically, it relates to literature concerned with the everyday and ordinary nature of family farm knowledge and practice.

Family farming also holds substantial political concern. Gardner (1996) writes that the establishment of the Common Agricultural Policy (CAP) was partly in response to the dramatic fluctuation of farmers' incomes due to market forces (such as cheap food imports), biological factors (e.g. the growth cycle of crops and livestock) and climatic conditions (e.g. drought or excess rain). Hill (2012) writes that this situation was particularly problematic for family farmers who also faced low incomes, small farm units (which made it difficult to adjust as the minimum size of a viable unit increased) and the loss of labour to other sources of employment. As a result, one of the objectives of

the Common Agricultural Policy was 'to ensure a fair standard of living for the agricultural community' (Hill, 2012). Further, Hill (2012, p. 43) writes that 'it was taken as axiomatic that the family farm was to be safeguarded and its economic and competitive capacity raised'. Reforms to the CAP in 1992 (MacSharry reforms), 1999 (Agenda 2000) and 2003, led to some change in the objectives of the policy. However, the aim to support farmers' incomes has been retained and, in the 2000s, became 'the central aim of the policy' (Hill, 2012, p.45).

This introduction will set out the concern of agricultural geographers with family farming in the UK and the contribution that this thesis makes to the sub-discipline. It is split into 3 sections. The first section is concerned with hypotheses of the demise of family farming, which were particularly significant in the years following the Second World War. Section two looks at the impact of agricultural change between the end of the 1980s and the current day, that led to the introduction of different farm activities such as diversification and organic farming, on prospects for the survival of the family farm. The third section is focused on recent anticipated changes to agriculture, which demand a re-consideration of the family farm and its survival. Finally, section four details the aims and objectives of this PhD thesis.

1.1 Post-war productivism and hypotheses of the demise of the family farm

Considering the current multi-faceted significance of family farming within the UK, based on particular theoretical perspectives, some agricultural analysts have predicted their demise. These predictions were particularly profound in

analyses of agricultural change in the years between the end of the Second World War and the 1980s. This phase of agriculture is known as 'productivism' due to the intense political pressure that was placed on farmers to produce, in order to alleviate food deficits following the war. To create increases in production, two key tools emerged. First, supported by funding from the Government under the 1947 Agriculture Act, research institutes invented a range of new inputs including agri-chemicals and crop strains (Buhler *et al.*, 2002). However, they were particularly concerned with the introduction of new agricultural technology. Second, capital to purchase these inputs was provided by greater connections with off-farm business enterprises such as banks and other financial institutions.

Political economists such as Cochrane (1958) and Windhorst (1989) analysed these macro, economic changes to argue that there was a separation of the US agricultural sector into two types of farm. The first type of farm was described as corporate, large-scale, run by a skilled workforce, profitable and attractive to investors and money lenders. In contrast, the second type of farm was described as family farms which were characterised as small-scale, run by unskilled family members, with profits sufficient only for survival and debt that made borrowing difficult. These differences meant that under productivism, corporate farms were able to attract finance from external bodies to purchase new technology and had staff with the required knowledge and skills to use them. In contrast, family farms had neither the finance nor trained staff required to adopt and use new technology. This meant that corporate farms in the US were able to continue increasing their production, while family farms found their profits diminishing. As a result of this, these

political economists hypothesised that family farms would not survive. For example, similarly, Windhorst (1989, p.274) argues that the development of technology and connections with external businesses means that it is 'increasingly difficult for small and medium-sized farms to compete with large-scale production units'. As a result, 'the fate of the traditional family farm seems to be sealed [...] this type of enterprise, according to the Department of Agriculture, has to be abandoned' (Windhorst, 1989, p.280).

The situation in the USA was seen by some British commentators/geographers as possibly reflected in the UK. For example, Bowler (1992) discusses how large farms had better access to the funding (through external agri-food organisations) and skills required to adopt new technology than their smaller counterparts. This resulted in smaller farms gradually losing profits until they went out of business altogether. Bowler (1992, p.14) states that then 'the land of small unprofitable (marginalised) farms is absorbed by purchase into larger farming units', which means that the success of large farms continues to increase.

This process was enhanced by the Common Agricultural Policy. At this time, the objective to support the incomes of family farmers was implemented by subsidising food production (Bowler, 1992). The European Union (EU) did this by setting minimum guaranteed prices for some farm products, which it would pay if the price on the world market dropped below this level (Gardner, 1996, Hill, 2012). This enhanced even further the increases in production that larger farms had already made through technology and external connections, which meant that compared to small farms they were disproportionately advantaged under the CAP. Reform to the CAP in 2003 removed this

connection between production and subsidy (known as 'decoupling') but farmers still receive income support through different mechanisms (see also Hill, 2012).

Despite its persuasion for agricultural geographers in the USA and, to a lesser extent, in the UK, some argued that this conceptualisation of the productivist agricultural sector as consisting of two farm types, one successful and one failing, neglected its diversity (see Munton & Marsden, 1991). Modified political economists sought to represent greater differentiation using methods such as interviewing, questionnaires and typologies. This resulted in two key conceptualisations of the agricultural sector: the 'disappearing middle' and 'subsumption'.

The 'disappearing middle' theory posits that in addition to the corporate and family farms identified by political economists, another farm known as a hobby or part-time farms existed (see Symes, 1992; Buttel, 1982; Munton & Marsden 1991; Munton, Whatmore, Marsden, 1989; see also Layton, 1978). At one end of the spectrum, it was discussed that hobby farms survived because they were run as very small enterprises not for profit, but for personal enjoyment and satisfaction. At the other end of the spectrum, it was said that corporate farms survived due to the ever increasing productivity and profits described by the political economists. This left the middle of the spectrum, occupied by family farms who apparently struggled to maintain their profits before disappearing (Symes, 1992; Munton & Marsden, 1991; Buttel, 1982, 1983; see also Layton, 1978).

Subsumption is a typology which categorises farms according to the extent to which they are controlled by 'wider circuits of external financial and

industrial corporations' (Whatmore *et al.*, 1987b, p.103). These circuits are made up of processing companies, manufacturers of technology and agri-chemicals, and banks or capital lenders (Whatmore *et al.*, 1987a&b). The typology is made up of four characteristic farms, which are outlined in Figure 1 (for more detail, see Chapter 2):

Figure 1: Whatmore *et al.*'s (1986a) typology of farms.

Farm type	Description
Marginal Closed Unit	A farm family is responsible for the ownership, control and running of these small-scale units.
Transitional Dependent Unit	A farm family owns and manages the unit, but they utilise a limited amount of external labour and credit to buy technology.
Integrated Unit	Units are controlled and run by a combination of internal and external individuals which ensures access to additional land, credit and technology.
Subsumed Unit	The unit is controlled and managed purely by external organisations that apply credit and technology to produce, process and retail food.

Family farms occupy two types of farm in the typology, which gives them slightly different prospects. Farms in the type marginal closed unit are described by Whatmore *et al.* (1987a) as producing just enough to sustain the farm family and will struggle to survive in the future. Farms in the type

transitional dependent unit are described as currently successful and profitable but in order to sustain this, they must expand and develop as a matter of urgency (Whatmore *et al.*, 1987a).

This discussion illustrates how prevalent hypotheses of the demise of the family farm were within agricultural geographers' analyses of agricultural change under productivism. Moreover, it reveals that these hypotheses were justified by two perceived deficiencies of the family farm. First, family farms did not adopt and use new forms of technology, which would increase their levels of production. Second, family farms did not adopt technology because they lacked connections with the broader agri-food system which would provide the required funding. There is, therefore, potential for research into how family farms in the UK survived productivist agricultural change.

1.2 Agricultural change since productivism and different opportunities for the family farm to survive.

The early-mid 1980s saw the emergence of an increasing awareness of the problems of over-production such as surpluses of food, environmental degradation and the cost of farm subsidies (Gardner, 1996; Symes, 1992; Hill, 2012). Consequently, there have been attempts to decrease the rapid increases in production and support environmental conservation. As already mentioned, the European Union has sought to achieve this by reforming the Common Agricultural Policy. The primary mechanism for this is 'decoupling' (Hill, 2012). Farmers now receive a single payment (under the Single Payment Scheme or SPS), which is set according to the amount of land they hold in Good Agricultural and Environmental Condition (GAEC). In 2015, this

will be replaced with the Basic Payment Scheme (BPS). Other policy schemes have encouraged voluntary conservation such as agri-environmental schemes (Hill, 2012).

These agricultural and policy changes have inspired debates in agricultural geography on the introduction of different types or eras of farming. These include post-productivism, alternative/sustainable agriculture in particular organic farming and multi-functionality. Agricultural geographers such as Ilbery and Bowler (1998) and Symes (1992) have used the term post-productivism to describe a reversal of the trends towards maximum food production. Multifunctionality is a term used for a form of agriculture which places the production of food within a variety of other non-productive activities (Potter and Burney, 2002; Potter & Tilzey, 2005; Wilson, 2007; Shucksmith, 2010; Holmes, 2006; McCarthy, 2005). Organic farming is basically food production without the application of agri-chemicals but this is underlain with non-productive activities, concerns and ideologies. For the family farm, these forms of agriculture appear to constitute new activities and positive opportunities, for survival, which are not tied to productivism. Each of these forms of agriculture have attracted significant debate and in some cases strong critique, which will be discussed later in this section and in greater detail in Chapter 2. This section will first explore these 'non-productive' new activities, which may be placed into the four categories of i) Diversification activities, ii) Forms of employment unrelated to food production and iii) Environmental conservation and iv) Different agricultural practices.

i) Diversification activities

Diversification is the incorporation of activities and enterprises on a farm which do not involve food production. Diversification is significant within literature on multifunctional and post-productivist agriculture. Farmers can engage with a range of diversification activities. Setting up farm-based accommodation for tourist visitors such as a bed and breakfast or a caravan/camping site is one of the most favourable diversification options (Evans & Ilbery, 1996; Brandth & Haugen, 2011; McElwee & Bosworth, 2010; Northcote & Alonso, 2011). Others include producing and selling rural crafts (e.g. basketry) and creating enterprises such as farm shop, fishery or pick-your-own scheme.

ii) Forms of employment unrelated to food production

Farmers may support the farm by undertaking work on or off the farm that does not constitute producing food. Examples of employment carried out off the farm include farm contracting, medical roles such as a nurse or general practitioner, catering, cleaning, and veterinary posts including a nurse or surgeon (Price & Evans, 2005). Price & Evans (2005) discuss how these roles are often undertaken by women who balance this off-farm work with their on-farm duties such as maintaining the farmhouse, bringing up children and farm activities (e.g. tending animals, book-keeping). Literature on multifunctionality discusses how farmers may also create employment opportunities (Marsden et al., 2002; Potter and Burney, 2002; Potter & Tilzey, 2005; Wilson, 2007; Shucksmith, 2010; Holmes, 2006; McCarthy, 2005). For example, development of the rural area such as the expansion and improvement of

broadband internet might enable farmers to work online (OECD, 2001). The OECD (2001) also emphasises the importance of diversification projects such as providing facilities for tourists to the rural area and activities such as retail (e.g. selling at farmers' markets).

iii) Environmental conservation

Environmental conservation involves active attempts to protect and preserve the agricultural landscape, flora and fauna. This activity is prevalent in literature on post-productivism, multifunctionality and organic farming. Moreover, UK agricultural policy encourages environmental conservation beyond that required to satisfy GAEC requirements for the Single Farm Payment, through agri-environmental schemes. Environmental Stewardship is an agri-environmental scheme which is administered by Natural England. It is made up of four elements: Entry Level Stewardship (ELS), Organic Entry Level Stewardship (OELS), Uplands Entry Level Stewardship (Uplands ELS) and Higher Level Stewardship (HLS) (Natural England, 2014b). Within these elements, farmers can carry out a range of activities that constitute environmental conservation. For example, farmers within Entry Level Stewardship can choose to conduct hedgerow, ditch or field corner management, introduce plots for skylarks in fields (areas of habitat used by the birds for nesting) or use a low level of inputs to create an area of permanent grassland (Natural England, 2014a). Although agri-environmental schemes are focused on conservation rather than the success of farmers, they do create different amounts of income (see Natural England, 2014a; Ilbery & Bowler, 1998; Symes, 1992; Morris & Potter, 1995).

iv) Different agricultural practices

Farmers may also continue to produce food, but in ways that incorporate different practices or activities. This is particularly prevalent in literature concerned with organic farming. For example, farmers can produce food organically in a way that does not use fertilizers and pesticides (Tovey, 1997). Producing food in this way can lead to financial gain for farmers, as organic products are often sold by retailers at a premium price. Moreover, organic farming connects to ideologies such as 'local quality food' or 'environmentally-friendly', which creates further opportunities for farmers (see Soil Association, 2013). For example, farmers can emphasise the added characteristics of their organic food (e.g. artisan-made, locally produced) through packaging or labelling, which might enable them to sell at a premium at a wider range of outlets such as farmers' markets or farm shops. Farmers could also connect their alternative form of food production with a diversification activity and set up their own organic farm shop. Farmers can also connect their organic farming to environmental conservation and enter their land into an agri-environmental scheme such as the Organic Entry Level Stewardship (OELS) (Natural England, 2014c).

The opportunities detailed in the above categories allow farmers to generate income through activities that do not depend on increasing food production. Some of the activities such as environmental conservation are particularly relevant to family farms, because it is more likely that they have retained the traditional practices favoured by agri-environmental schemes. As a result, farmers do not depend on the establishment and maintenance of connections

with external organisations to acquire funding in order to purchase new forms of productive technology. Consequently, it could be argued that these activities have allowed family farms to step off the technological treadmill and survive (see Marsden & Sonnino, 2008; Woods, 2011; Wilson, 2008).

This range of non-productive activities seems to offer farmers opportunities to survive. However, investigations into the impact and uptake of these has found that they have not proved to be significant options for family farmers seeking to survive. For example, it has been found that money generated through off-farm work, diversification activities and agri-environmental schemes is not used to improve the financial situation of the family, but is spent on enhancing the productivity of the farm and its value for successors (Price & Evans, 2005; Evans, 2009; Drummond *et al.*, 2000). This demonstrates that despite carrying out these activities, family farmers retain a productivist mindset, which limits the potential to survive through undertaking less or no food production. Moreover, observations of the use of technology to intensify and concentrate organic farming suggest that it does not in reality offer different opportunities for family farmers to those of post-war productivism (Ilbery *et al.*, 1999; Tovey, 1997, 2001; Anderson, 2011; Rosin & Campbell, 2009; Goldberger, 2011). The deficiencies of these activities in enabling the family farm to survive has contributed to substantial criticism of the conceptualisations of the phases of agriculture within which they are discussed (for post-productivism see Evans *et al.*, 2002; Wilson, 2001; Wilson & Rigg, 2003; for multifunctionality see Woods, 2011; Marsden and Sonnino, 2008; Potter and Burney, 2002; Wilson, 2007, 2008; for alternative forms of

agriculture such as organic farming see Ilbery *et al.*, 1999; Tovey, 1997, 2001).

This section has demonstrated that the introduction of new activities connected to the agricultural eras that have arguably emerged since the early-mid 1980s of post-productivism, multifunctionality and alternative or organic farming do not explain the survival of the family farm. Consequently, there remains significant potential for serious academic enquiry into the persistence and contemporary significance of family farming through periods of agricultural change in the UK.

1.3 Anticipations of future agricultural change and the family farm.

In around 2009, an awareness of the potential impact of global events such as a rising world population, fluctuating food prices and climate change on UK food production began to emerge in publication. Policy think-tanks, processes and organisations such as Chatham House, The Royal Society (2009), The Smith Institute and Foresight (2011) have recommended the creation of a whole new agri-food system (Ambler-Edwards *et al.*, 2009; Bridge & Johnson, 2009). For example, Foresight (2011, p.35) advocates the introduction of a system that promotes 'sustainable intensification [which] means simultaneously raising yields, increasing the efficiency with which inputs are used and reducing the negative environmental effects of food production'. New forms of technology are key to this new system. Ambler-Edwards *et al.* (2009, p.28) write that technology 'will be a key determinant of the [the] capability' of the new system. Examples of technologies which are considered to be particularly significant include genetic modification (GM), new fertilizer

formulations, precision-applicators (which enable the targeted application of fertilizers) and methane digesters (which aid the decomposition of organic material) (see Ambler-Edwards *et al.*, 2009).

Some agricultural geographers have suggested that these changes may constitute the onset of a new agricultural era. For example, Ilbery and Maye (2010, p.166) write that these changes 'could be interpreted as the start of a neo-productivist phase of agricultural restructuring in the UK, characterised by an effective, rather than exploitative, use of resources over a long time period'. They emphasise the role of technology to neo-productivism, explaining that while genetic modification attracts debate and controversy 'some food scientists argue that GM is required in efforts to reconcile demands on agricultural productivity with more sustainable food production' (Ilbery & Maye, 2010, p.177). There is a need for informed research into how family farmers may actively adapt to this change.

However, there is significant potential to develop this conceptualisation of neo-productivism. Some commentators have suggested that there needs to be greater concern with how the convergence of increased food production and environmental conservation may become a reality. For example, Sage (2013) argues that food production in itself has a negative impact on the environment, which challenges the balance envisaged under neo-productivism. In addition, Sage (2013) states that the dominance of powerful corporate interests over the UK agri-food system may mean that conservation is easily marginalised in favour of economic gain through food production. Moreover, while substantial attention is given to increasing the quantity of

food produced, very little is spent on the identifying the type, quality, provenance or nutritional value of this food (Kirwan & Maye, 2013).

This potential has begun to be realised with studies that take a 'bottom-up' approach to this agricultural change. This work draws on theoretical perspectives that emphasise agro-ecology, localisation, food sovereignty, agro-ecology and social justice (for more detail on these perspectives, see Kirwan & Maye, 2013; Anderson, 2013). For example, Kneafsey *et al.* (2013) explore the understandings and reactions of consumers to food security. The study found that consumers experience everyday concern about their lack of control over the system which enables their access to affordable, nutritious and appealing food. In addition, some agricultural geographers have begun to explore understandings of neo-productivism and food security to farmers and other agricultural actors in Australia (Lawrence *et al.*, 2013), New Zealand (Rosin, 2013) and the UK (Fish *et al.*, 2013). Fish *et al.* (2013) found that farmers in the South West of England were aware of these discussions and prepared to increase their production. This work offers detail and nuance to the increased food production that is envisaged under neo-productivism.

These compelling early conceptualisations and insights suggest that neo-productivism is set to bring about significant change to the UK agricultural sector. While there has been some exploration of farmers' understandings of this change, how it will be implemented within the farm context remains unclear. Consequently, this new agricultural change means that this investigation of the importance and survival of the family farm is highly relevant. Moreover, this investigation will add a different perspective to conceptualisations of neo-productivism within agricultural geography.

1.4 PhD Study

This introduction has argued that agricultural geographers concerned with conceptualising agricultural change from the end of the Second World War to the current day have not sufficiently explored the role and survival of the family farm. Commentators on the post-war productivist era between the end of the Second World War and the early-mid 1980s argued that the family farm would be driven to extinction. Practices and approaches to farming that have emerged since the 1980s and conceptualised as the phases of post-productivism, multifunctionality and organic farming have not provided significant opportunities to enable family farms to remain in business. Consequently, these attempts to use top-down macro approaches to understand agriculture in terms of phases (e.g. post-war productivism or post-productivism) have prioritised the experience of large businesses and policy-makers, but neglected the presence, contribution and persistence of family farms. Therefore, this PhD study adopts a 'bottom-up' approach to investigate the contemporary family farm and its survival within the UK agricultural sector.

Studies in agricultural geography that provide a definition or detail the nature of the family farm are lacking and out of date. However, acknowledgement of their significance in the 1980s led to some research that was focused on defining the family farm headed by agricultural economists Gasson and Errington (see Gasson *et al.*, 1988). Their latest publication in 1993 is the most recent attempt to define the family farm through a typology of elements such as the importance of succession, inheritance and family labour. While this work has provided a useful framework for understanding the family farm, it does not explore the connections between elements that enable

it to function. It also lacks detailed evidence from the practical and real experience of family farmers. As a result, subsequent work involving family farmers has adopted methods inspired by the cultural turn in geography such as detailed questionnaires, focus groups, ethnography and participant observation (see Morris & Evans, 2004; Hughes *et al.*, 2000). However, this work has not been focused on the family in itself but on issues such as diversification, adjustment strategies (e.g. Evans, 2009), agri-environmental policy, research methods (although see exception Gray, 1998; Bennett, 2000, 2002, 2005b; Pile, 1990; Riley, 2010). This means that there has been an unfortunate persistence of the neglect of the family farm as an interesting and productive research focus within agricultural geography. Rather, the family farm has been a 'bi-product' of other studies. By extension, there has been little concern with how farm families make decisions, work together and change their practices in ways that promote their survival. Consequently, this study draws the innovative methods that have considered the family farm indirectly to conduct an in-depth investigation of the everyday activities, routines and relationships that define a contemporary family farm. It will also analyse whether the form of the family farm is important to its success and survival.

Research on the introduction of new farming activities (such as diversification or agri-environmental schemes) associated with post-productivism and multifunctionality found that family farmers have retained the mentality, actions and practices associated with post-war productivism. Productivism was implemented via two connected mechanisms. First, farmers' were required to establish and maintain connections with external individuals

and organisations who could provide capital. Second, farmers needed to use this capital to purchase technology, which would increase their production. As discussed, many agricultural geographers posited that this would drive family farmers to extinction or complete subsumption. However, the actual survival of family farmers and their productivist values and practices, suggests that these mechanisms are significant to their persistence and independence. As a result, this PhD study will explore how a family farm understands, introduces, interacts and maintains technologies. Moreover, the study will consider how the family farm relates to a range of inter-connections with external individuals, institutions and organisations that radiate out from the family farm. The thesis will evaluate whether technology and external connections are tools of destruction or survival for the family farm.

1.5 Aims and objectives.

The following provides a brief overview of the PhD study aims and objectives:

Aim: Undertake a contemporary investigation into the family farm in the UK and actions adopted to survive through periods of agricultural change since the end of the Second World War.

Objective 1: Conduct an in-depth investigation of a family farm to reveal the everyday routines, decisions, practices, relationships and events that define it.

Objective 2: Explore the processes of understanding, introducing, utilising and maintaining technologies within the family farm.

Objective 3: Identify, map and interrogate the engagements between the family farm and external individuals and organisations.

CHAPTER 2: LITERATURE REVIEW

This chapter will outline the context and justification for this thesis, which is grounded in research conducted within the discipline of agricultural geography. This reveals a gap in current knowledge that sets out the contribution that this thesis makes in investigating the family farm and the survival it has adopted to persist through periods of post-war agricultural change. The literature reviewed and critiqued within this chapter may be split into four key areas: defining the farm family, post-war productivism, alternative forms of agriculture and neo-productivism.

The first area is work that has attempted to formulate a definition of the family farm. Agricultural geographers have found this task difficult due to the diverse and ever changing nature of the collection of family farms in the UK. The most recent comprehensive attempt at defining the family farm was published in 1993 by Gasson and Errington (1993), which means that this material is now outdated. Indirect work concerned with issues that affect the family farm such as gender roles (Bennett, 2004, 2005b; O'Hara, 1998; Brandth, 1994), agri-environmental practices (Riley, 2009) and adjustment strategies (Evans, 2009) has illuminated some of the elements of the definition (Gray, 1998). It has also offered some theoretical and methodological possibilities for investigating the family farm, which will be discussed in Chapter 3 and 4. Reviewing this work will inform the reader of the meaning of the family farm in agricultural geography and how it is understood in this thesis. Critical analysis of this work will also justify the first objective of this thesis to conduct an in-depth, long-term ethnographic

exploration to show the internal dynamics of a current UK family farm, which may help to define its survival.

The second and third areas of work are concerned with the role of the family farm within the agricultural sector of the UK. The second area of work is made up of hypotheses of the demise of the family farm. Some commentators have termed the years of agricultural change following the Second World War post-war productivism. This concept has since been discredited. Looking at this period, agricultural geographers in the USA and UK argued that political pressure, brought about by global economics/corporatism, to increase production would force family farms out of business. The inability of the family farm to attract funding from external agencies such as banks or food processors to introduce new forms of technology would fuel this demise. The third area of work is focused on agricultural phases that followed post-war productivism, which have been conceptualised as 'post-productivism', multifunctionality and organic farming. These forms of agriculture appear to move away from productivism to offer other opportunities for family farms to survive such as diversification, adding value to products through labelling as 'local' or 'quality food', and agri-environmental schemes. However, a critical analysis of these types of agriculture will show that the current activity of family farms is still based on productivist goals and practices (Burton, 2004; Evans *et al.*, 2002). Despite significant predictions that it would lead to their demise, family farmers seem to be rejecting these alternative forms of agriculture in favour of finding a way to acquire funding and use technology in order to continue existing under productivism.

Reviewing these two areas of work highlights the inability of agricultural geographers to explain the survival of family farming through post-war productivism to the current day. This provides the foundation for the overall aim of this PhD thesis, which is to produce an explanation for the survival of the family farming throughout periods of agricultural change in the UK. Moreover, the continued significance of productivism for family farmers' demands investigation into how they engage with the ways in which it is implemented. Consequently, objectives three and four explore the role of technology and external agencies on a family farm.

The fourth area of research is about the onset of new phase of agriculture known as 'neo-productivism'. This phase is defined by a renewed emphasis on increasing productivism, which is implemented with an environmental conscious or achieved in ways that are sustainable. It is envisaged that this will be implemented through technology such as genetic modification (GM). Neo-productivist agricultural change gives a sense of urgency to the aim of this thesis to explain the survival of the family farm, as it is unclear what this new phase may mean for their future existence. Given the emerging policy signals, it is important to postulate the place and significance of the family farm within neo-productivism. In addition, continued emphasis on technology as a way to administer this agricultural change provides further justification for objective three, to explore the role of technology on a family farm.

2.1 Defining the family farm

Defining the family farm has proved a particular challenge for agricultural geographers. The contingency and variety of family farms in the UK has made it very difficult to elucidate them in a clear and useful definition. However, some agricultural geographers have conducted research purely in order to define the family farm. The most recent example of this in agricultural geography is Gasson and Errington's (1993) publication '*The Farm Family Business*'. Moreover, this work is regarded in agricultural geography as a 'seminal study – arguably one of the most significant explorations of the family farm' (Riley, 2009, p.246).

The definition proposed by Gasson and Errington (1993) is not in itself an empirical investigation or analysis of the family farm, but is a synthesis of studies which 'illustrate[s] the concepts and issues which follow from our understanding of what it means to run a family farm business' (Gasson & Errington, 1993, p.8). The book is primarily focused on studies conducted within agricultural economics but also draws on those from rural sociology and social anthropology. From this synthesis, Gasson and Errington (1993) provide a definition of a family farm which is made up of six elements, which will now be discussed in detail.

i) Principals related by kinship or marriage

Gasson and Errington (1993, p.21) describe kinship relations as 'central to the farm family business'. Kinship relations commonly refer to a nuclear family where the principals may be a husband and wife or, when they retire, their offspring. Alternative arrangements may be sharing the role of principal

between siblings, or between a sibling and their partner. Gasson and Errington (1993) explain that less ideal arrangements would be an individual acting solely as principal (such as a widow or the unmarried child of principal parents).

ii) Business ownership combined with managerial control

Gasson and Errington (1993, p.21) state that a farm 'would cease to be a family business if the ownership or management functions passed out of family control'. A farm family may own a significant amount of the land and assets upon which the business is based. However, due to the tradition of tenant farming prior to the Second World War, Gasson and Errington (1993) state that this is not absolutely essential. It is more important for the family farm to retain control over land and assets. For example, they must be able to make their own decisions over the type and amount of crops to plant or livestock to breed, invest in new buildings or machinery and change the working roles of family members.

iii) Family provides capital

Gasson and Errington (1993) explain that it is unlikely that a farm family will own the entirety of the capital invested in the business. The substantial amount of capital required to run a family farm means that many will borrow from external organisations such as banks. To remain a family farm under the definition, Gasson and Errington (1993) state that it is important for the family to retain control over how the capital is used on the farm.

iv) Family members do farm work

Gasson and Errington (1993) state that in many cases, the farm family provide the labour on the farm. Farm labour incorporates manual and non-manual work as different family members undertake different tasks such as rearing livestock, caring for children, growing crops and book-keeping. In addition, family members may not provide farm labour on a full-time basis. For example, retired principals may help out during busy times such as hay baling or sheep shearing.

v) Family lives on the farm

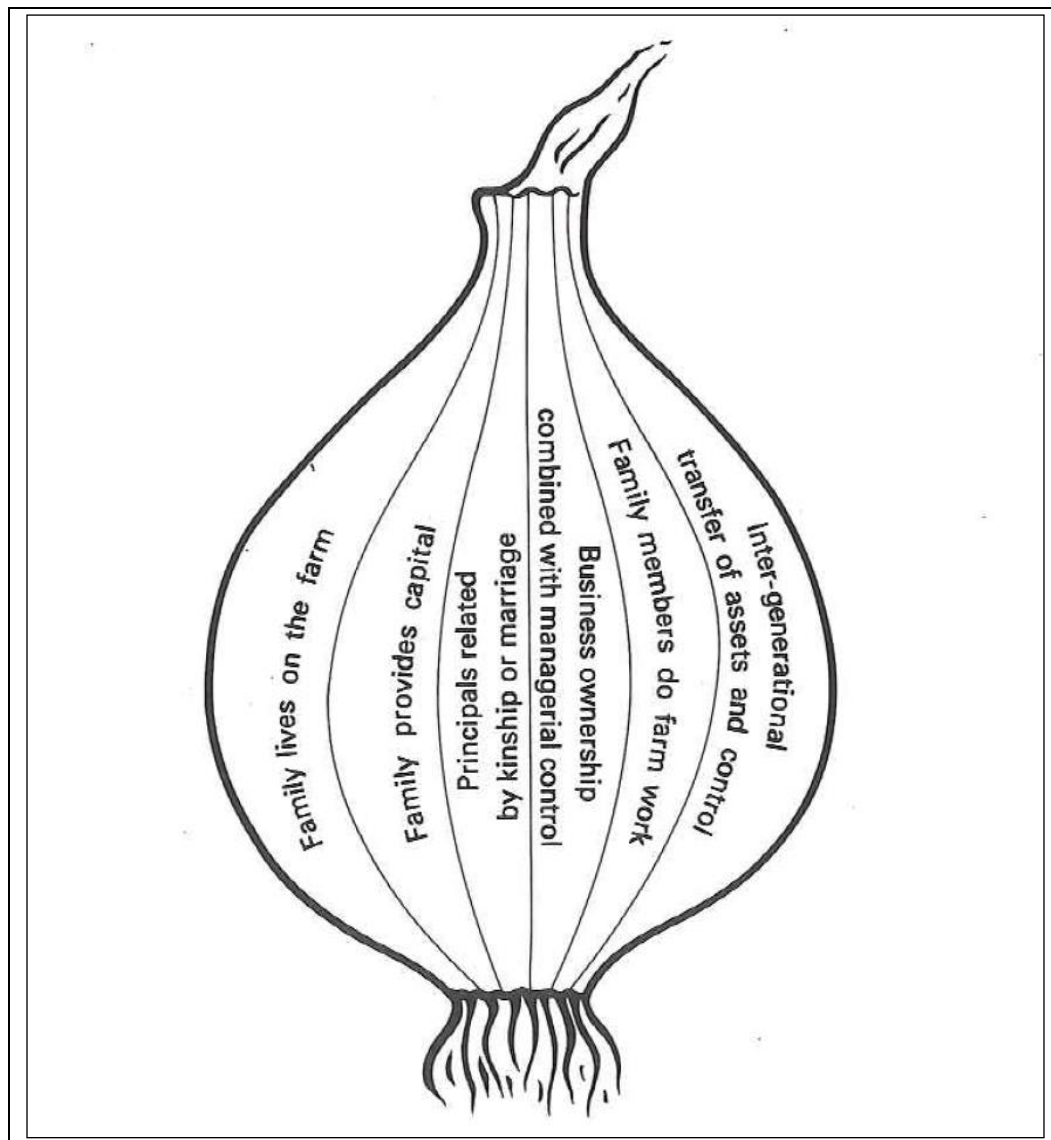
This element is very important, as Gasson and Errington (1993, p.22) state that 'the definition requires the family to live on the farm'. The close proximity of the family to the farm means that they can be aware of, and respond to, demanding situations related to livestock (e.g. sick or labouring sheep), the weather (such as the freezing of pipes providing drinking water for animals) or crops (e.g. attacks by insects).

iv) Inter-generational transfer of assets and control

Gasson and Errington (1993, p.23) remark that 'with the ideal type [of farm family] there is a presumption that the business will be handed on to a member of the family'. However, this may not occur on every family farm as, for example, the principals may not have children willing to take on the business.

Gasson and Errington (1993, p.20) state that these six elements represent 'the ideal type of farm family business'. However, the six elements are also attributed with different levels of importance, which makes it possible for the definition to apply to a range of family farms. To represent this, Gasson and Errington (1993, p.20) use the analogy of an onion, where the inner layers are more significant than the outer layers (Figure 2):

Figure 2: Gasson and Errington's (1993) representation of a farm family business



Gasson and Errington's (1993) work provides a good starting point for thinking about the family farm, however there are several areas in which it may be improved (see Chapter 3). Some of these areas have been outlined and briefly explored by agricultural geographers not directly concerned with defining the family farm, but with issues that affect them such as patrilineality (Bennett, 2004, 2005a&b; O'Hara, 1998; Price and Evans, 2005, 2006) agricultural policy (Morris & Potter, 1995; Pile, 1990), adjustment strategies and diversification (Evans, 2009), and processes of subsumption (Whatmore *et al.*, 1987a&b). Chapter 3 will discuss these in more detail. However, one of the most obvious areas, which is particularly relevant to this chapter, is the date in which this literature was published.

Social, political, agricultural and disciplinary changes within the UK since 1993 mean that the definition of the family farm published by Gasson and Errington (1993) needs to be updated. For example, fluctuating numbers of students going to University may have had an impact on the amount of family labour available to the farm (Higher Education Statistics Agency, 2014). Within the agricultural sector, the impact of reforms to the Common Agricultural Policy in 1992, 1999 and 2003 may have changed family members control over the practices on their farm. For example, the introduction of the Single Farm Payment in 2005, which required farmers to comply with a set of requirements including keeping their land in Good Agricultural and Environmental Condition (GAEC), may have led to changes in how the family farmers manage and operate their land (Rural Payments Agency, 2014). Indeed, as part of his exploration of farmers' reactions to a

changing policy context, Pile (1991, p.405) argued that the introduction of milk quotas in 1984 decreased the influence family farmers felt they had over decisions concerning the control of their land, which led to feelings of 'powerlessness and inevitability'.

This section has detailed how the family farm is understood and defined within agricultural geography and beyond. This understanding is dependent on the most recent definition of the family farm, which was published in 1993 by Gasson and Errington's (1993). Subsequent work in agricultural geography has indirectly considered indirectly the family farm as the result of investigation into issues such as the impact of changing agricultural policy, or has explored particular elements of them such as succession or children. Consequently, the first objective of this study fulfils potential to conduct an in-depth investigation of a family farm to reveal its routines, decisions, practices and relationships.

2.2 Post-war productivism and hypotheses of the demise of the family farm

Post-war productivism is a term used to describe a phase of agriculture that took place between the years following the Second World War and the 1980s. The term refers to the dramatic increases in food production that occurred at this time. These increases were considered a necessity due to severe food deficits, which became significant as the country recovered from the war. They were fuelled by tools made available by the mechanisation and industrialisation of agriculture, and the introduction of new government policy.

Agricultural geographers studying these agricultural changes hypothesised that post-war productivism would contribute to the demise of the family farm.

The mechanisation and modernisation of agriculture refers to the increased use of machinery in farming, which took place from approximately the 1920s in the US and in the 1940s in the UK (Bowler, 1992; Troughton, 1985). A primary example of mechanisation is the replacement of horse drawn ploughs and cultivators with tractors. The industrialisation of agriculture is a term attributed to processes of change which involved the size of production holdings, the management of climatic conditions, the use of energy and capital, the amount of externally sourced inputs, technology and the nature of labour (Bowler, 1992; Troughton, 1985; Gregory, 1982). These changes were unevenly distributed across the agriculture sector, becoming most pronounced in sectors such as glasshouse horticulture (Bowler, 1985, 1992; Healey & Ilbery, 1985). Changes here included the production of crops such as salad leaves, tomatoes and flowers in large-scale 'rigorously controlled environments' where moisture, temperature, soil and the application of agrichemicals were controlled 'by a workforce with specialist skills' (Bowler, 1992, p.13). Within the farm sector, Bowler (1992, p.13; Bowler, 1985) conceptualised changes associated with the industrialisation of agriculture as three 'structural dimensions': intensification, concentration and specialisation. The following table (Figure 3) details these dimensions:

Figure 3: Bowler's conceptualisation of the industrialisation of agriculture

Process	Description
Intensification	Increased outputs per hectare are created with less labour through the application of externally sourced technological inputs such as machinery, biotechnology and agri-chemicals.
Concentration	The amount and type of food production becomes limited to a decreased number of larger farm units, which are found in fewer geographical regions. Greater connection with the agri-food system for processing and retail of farm goods.
Specialisation	Farm labour becomes specialised and expert. The variety of goods produced by individual farms and regions decreases.

(Bowler, 1992, p.14)

These processes of farm change were enabled by the use of two inter-related key tools: technology and connections with the broader agri-food system.

The introduction of technology, which was encouraged by funding made available through agricultural policies such as the 1947 Agricultural Act in the UK. A variety of technologies were introduced including attachments for mechanical equipment such as tractors , biotechnology, new varieties of crops and animal breeds, and agri-chemicals. These enabled farmers' to intensify their production to increase the amount that they could yield from each hectare of their land. Cochrane (1958, p.90) argues that new technology contributed 'almost exclusively' to an increase of 'total farm output [by] some 90 per cent between 1914 and 1956'.

Connections between farmers and the broader agri-food system made it possible for production to become concentrated and specialised. Farmers became closely linked with the industries that processed and marketed their goods (Hart, 1978). In some instances, these relationships were solidified through the use of contracts which guaranteed farmers an income and industry a supply of goods (Bowler, 1992). Some industries also used contracts to specify methods of production and the use of inputs. The finance received by farmers through these arrangements and other organisations also made it possible for them to borrow money for the adoption of new technology, which further increased the process of intensification. Windhorst (1989, p.271) writes that the amount US farmers borrowed significantly increased during this period, from 'about \$2,000 of loans [in 1950], the average had reached \$50,000 in 1985'.

The rapid and significant increases in production that these tools created led observers and analysts to term to this agricultural era post-war productivism. In the US, these agricultural changes inspired political economists to analyse the impact or consequences on the range of farming types within the agricultural sector (e.g. Cochrane, 1958; Windhorst, 1989; Gregory, 1982). Categorising farms predominately according to their annual sales, these political economists identified the prevalence of just two types of farm within the sector: large-scale and small-scale.

Large-scale farms are described as farms which are profitable; Windhorst (1989, p.272) explains that these are 'farms with \$500,000 or more in annual product sales'. They are also owned, managed and operated by

individuals who are skilled, innovative and open to new ideas and inputs such as technology (Cochrane, 1958). As a result, these farms had established connections with businesses within the broader agri-food system such as food processors, because they were willing and able to modify their farming to produce a guaranteed amount of farm goods by a set time. They were also well informed and supplied by research institutes, who saw a clear market for their newly developed technologies. They were also perceived as reliable borrowers of finance by banks and other financial institutions.

In contrast, small-scale farms are described as those whose profits were only sufficient for maintaining the survival of the family farm. Windhorst (1989, p.272) states that these farms had 'less than \$100,000 in annual product sales'. They were run by families who did not undertake regular training to keep up-to-date with efficient and modern farming practice. As a result, these family farmers found it very difficult to conceptualise new ideas, adopt alternative methods and introduce innovations such as technology (Cochrane, 1958). Small-scale farms were therefore unattractive to other businesses within the agri-food system because they were unable to provide a significant amount of farm goods to be dispatched according to a strict timeline. Their lack of interest in making this possible through the adoption of new inputs also made them unfavourable to research institutes. Consequently, these farms were unlikely to be successful in borrowing finance, as banks and finance advisers felt that there was no clear or reliable plan for repaying the credit.

These differences meant that there were contrasting consequences for large- and small-scale farms under the industrialisation of agriculture because

it required them to use the tools of established external connections to adopt new technological inputs. Cochrane (1958) theorised these consequences using the conceptualisation of a technological treadmill.

Cochrane (1958) outlines how large farms used their external connections to acquire funding to urgently adopt new inputs from research institutes. As Windhorst (1989, p.271-272) also writes 'there is no doubt that the larger farms benefited from the results of the public support for agricultural research'. This meant that they were the first farmers in the agricultural sector to introduce new technology which rapidly increased their production. As such, Cochrane (1958, p.95) termed these farmers 'Mr. Early Bird'. Selling these goods to other businesses in the agri-food system led to even greater profits. In contrast, small farmers, who Cochrane (1958) labelled 'Mr. Average Farmer', did not have the external connections to enable quick access to finance to adopt new inputs. As time had progressed before they could afford to introduce technology, large-scale farms had flooded the market with farm goods which had decreased their value. Small farms were then forced to find funding for even more technology, simply to maintain their level of profit to enable their survival. Cochrane (1958, p.96) therefore described how 'the average farmer is on a treadmill with respect to technological advance':

'In the quest for increased returns, or the minimization of losses, which the average farmer hopes to achieve through the adoption of some new technology, he runs faster and faster on the treadmill. But by running faster he does not reach the goals of increased returns; the treadmill simply turns over faster' (Cochrane, 1958, p.96).

Moreover, the treadmill would not cease until small farmers could no longer continue acquiring money and technology and would cease to survive.

Cochrane (1958, p.97) describes how small farmers change from Mr. Average Farmer to 'the laggard, who will not or cannot adopt the new technolog[y]' and find themselves in a 'tragic' position. This proposed death of the family farm was also reflected in the work of other US political economists such as Windhorst (1989) and Wallace (1985).

Some political economists proposed that the situation in the US would be matched by that experienced in the UK. For example, Bowler (1992, p.16) perceived increasing inequalities between farms of different 'sizes, types and locations'. This inequality grew as large farms were more able to acquire funding through external organisations to purchase technology than small ones. Bowler (1992, p.18) argued that 'the gap between small and large farmers has widened [...] [and] the farm-size structure has tended to polarize'. This widening was said to continue until the loss of profits forced the smaller farms out of business entirely. The larger farms were then able to become even more successful through the process of farm amalgamation (purchasing the small farms to further increase their land) (Bowler, 1992).

This process was supported by UK policy such as the 1947 Agriculture Act and the Common Agricultural Policy. The 1947 Agricultural Act introduced funding for research institutes to enable them to create new forms of agricultural technology (Buhler *et al.*, 2002). This ensured the continued availability of tools which large farms could purchase (using funding provided

by external organisations) to increase further their level of production. During the era of post-war productivism, one of the central aims of the Common Agricultural Policy was to protect the social welfare and financial situation of small family farmers (Hill, 2012). This was implemented by subsidising food production (Bowler, 1992). The European Union (EU) did this by setting minimum prices for goods such as grain, milk, beef cattle and sugar (Gardner, 1996). If the market price fell below the minimum price, the EU would buy the the processed version of these goods (e.g. flour, butter, beef carcass and granulated sugar) from food traders. The products were then stored until the market price increased, when the EU sold the goods and recouped its money (Gardner, 1996). Despite the fact that farmers had to liaise with food processors and traders to receive the subsidy which was intended to support their income, they did receive a guaranteed income. Moreover, while smaller farms were restricted in the amount of subsidy they could receive as their production was limited by a lack of funding for technology, large farms that were able to increase their production received ever greater amounts of subsidy. As a result, despite its aim to support the incomes of farmers, small farms in greatest need were not adequately protected (Hill, 2012; Gardner, 1996). Awareness of this problem meant that the CAP was reformed in 2003 to remove the relationship between farm subsidies and production (decoupling) (see Hill, 2012; Gardner 1996).

Some agricultural geographers in the UK considered theories of the increasing polarisation of farms into two discreet types, large and small, too simple. For example, Munton and Marsden (1991) argued that these

neglected the variety of agricultural forms within the sector. The introduction of modified political economy encouraged agricultural geographers to move beyond macro economic analyses to consider the processes, behaviours and power differentials present within farming. To do this, they analysed material collected using methods such as interviews and questionnaires to create typologies. These typologies showed how there were more than two types of farms within the sector and, as a result, more than two outcomes in terms of their success and survival. These outcomes were termed 'the disappearing middle' and 'subsumption'.

The theory of the 'disappearing middle' argues that the agricultural sector is composed of three different types of farm (Buttel, 1982, 1983; Symes, 1992, Munton & Marsden, 1991). The first type refers to large farms which are run by corporate agri-business interests. The second type is known as a hobby or part-time farm, which is defined as a part-time enterprise run by its owners purely for personal enjoyment and satisfaction (Munton, Whatmore, Marsden, 1989). The third type are small farms which are owned and managed by families. These three types of farm had different outcomes under post-war productivism. The first type of farm, large corporates, survived due to the increases in production they could sustain through the adoption of technology using funding from external sources. The second type of farm, hobby or part-time, survived because they were not operated as a sole or primary source of income but were funded by other forms of non-agricultural employment. This resulted in the third type of farm, small family, struggling to afford technology to increase production and identify other sources of

income/employment to retain its place in the agricultural sector (Buttel, 1982; Symes, 1992, Munton & Marsden, 1991; Layton, 1978).

Subsumption is a theoretical typology which is based on an analysis of the degree of control farmers experience as a result of their connections with entities that exist in the broader agri-food system (Whatmore *et al.*, 1987a&b). Whatmore *et al.* (1987a, p.31) identify three different forms of penetration: a) technology b) credit relations and c) 'marketing linkages'. As such, the theory moves beyond perceptions of external connections as responsible for the extinction of the family farm, but investigates the interactions between the internal and external facets of agriculture (Whatmore *et al.*, 1987a). In so doing, Whatmore *et al.* (1987a, p.23) aim to be 'sensitive to individual variations in farm production relations'. The typology is composed of four categories, which are related to each other by their position along a spectrum or continuum. Whatmore *et al.* (1987a, pp.30-31) explain that at one end of the spectrum (marginal closed unit) exist farms which are "traditional" family farm owned, managed and worked' and at the other (subsumed unit) are farms which are 'owned by a corporate food manufacturing company and managed by a farm management company using contract labour'. Each of the categories are outlined in detail below:

- **Marginal Closed Unit**

These are small-scale units which are owned, controlled and run by farm families. The unit does not borrow finance or purchase significant inputs (e.g. technology) from external organisations. The farm exists on

the margins of commercial agriculture and its success is sufficient only to sustain the farm family.

- **Transitional Dependent Unit**

Transitional dependent units are owned and managed by a farm family, but which utilise some hired labour. They have small links with external organisations, through the borrowing of credit and purchase of technology. The farms are currently viable through their contribution to commercial agriculture, but they need to develop and grow to maintain this.

- **Integrated Unit**

These units controlled and run by a combination of family and non-family individuals or companies. The farms expand by renting additional land from multiple landlords. Other links with external organisations are extensive through the borrowing of credit to buy new technology. The units have a high-input high-output approach which ensures viability.

- **Subsumed Unit**

The unit is controlled, managed and run by external corporate (non-family) organisations. These organisations may not be connected to farming but to food processing or supermarket retail. Further external

links are very extensive, which ensures a ready supply of credit and technology. They also provide the facility to process, package and market farm goods for retail.

The categories integrated unit and subsumed unit refer to types of farm which are not owned, managed or run exclusively by a family farm. Of greater relevance to this thesis are the categories of marginal closed unit and transitional dependent unit.

Farms in the type marginal closed unit are described by Whatmore *et al.* (1987a) as producing just enough to sustain the farm family. As a result they are 'surviving on the margins of commercial agriculture' (Whatmore *et al.*, 1987a, p. 32). Whatmore *et al.* (1987a, p.31) argue that these many of these farms 'fail to survive as full time commercial enterprises beyond the tenure of the existing occupier'.

Farms in the type transitional dependent unit are described as 'perhaps the most volatile' because they are at a stage where they need to expand their external connections to provide the credit and technology in order to survive. If this is not undertaken, the farm family will be required to move away from food production and develop 'non-agricultural sources of income and business interests' to survive (Whatmore *et al.*, 1987a, p.33). As a result, while this unit may survive, it will not exist in the form of a family farm (Whatmore *et al.*, 1987a).

This section has reviewed research conducted to trace the history of interest in family farm survival. The period between the end of the Second World War

and the early-mid 1980s was defined by political pressure to increase food production. These agricultural changes attracted the attention of agricultural geographers and economists from the US and the UK who sought to construct hypothesis of the impact on the different types of farm within the respective agricultural sectors. They argued that a lack of connection with external elements of the agri-food system would result in an inability to fund the adoption of technology developed to increase production. This would lead to their complete extinction. However, discussion of the definition and significance of the family farm in Chapter 1 and Chapter 2 of this PhD thesis indicates that these hypotheses of the demise of the family farm did not become a reality. Rather, it is likely that family farms have approached survival in a variety of ways. It is unclear whether family farmers did find a way to use the tools of post-war productivism, technology and external connections, in such a way that led not to their demise but to their continuation. Therefore, there is a need to fulfil a significant gap in knowledge of the activities, decisions and planning that family farmers have undertaken to survive through periods of agricultural change. The durability of the family farm means that we must understand them if future agricultural policy is to be successful. This must incorporate the possible role of interactions with technology and off-farm external connections. An appropriate theoretical and methodological framework needs to be constructed to fulfil this potential. As a result, the overall aim, second and third objectives of this PhD thesis are to investigate the family farm and the role of technology and external connections in its survival.

2.3 Agricultural change since productivism and different opportunities for the family farm to survive

An awareness of the negative elements of productivism began to emerge in the early-mid 1980s. This was focused on the surpluses of food evocatively described as 'butter mountains' and 'wine lakes', the loss of countryside features like hedgerows and woodland, and growing awareness of the financial cost of the CAP (Gardner, 1996; Symes, 1992; Hill, 2012). As a result, the European Union has acted to halt levels of production and offer some protection to the rural environment. This has been implemented through the withdrawal of subsidies for production and the introduction of direct payments, set aside and agri-environmental schemes (see Hill, 2012).

For agricultural geographers, the agricultural change that has resulted from this policy reform has offered potential for conceptualisation in three key ways: post-productivism, multifunctionality and alternative or sustainable forms of agriculture. The most common representation of the latter is organic agriculture. In turn, these conceptualisations have been reviewed, applied and critiqued. For family farmers, this agricultural change offers the opportunity to engage with new approaches and activities on their farm. These include organic farming, diversified enterprises such as the provision of tourist accommodation or pick-your-own sites, and agri-environmental schemes (which may involve maintaining a meadow or creating hedgerows). It could be considered these new approaches and activities make it possible for farm families to cut the connection between their survival and attracting funding to adopt technology to increase production that existed under productivism.

This section will critically discuss the conceptual debates that focus on this period of agricultural change. It is particularly concerned with exploring the new approaches and opportunities for operationalisation on family farms. From this, it will analyse the impact on the survival prospects of family farms.

Proponents of post-productivism have noted that the term is difficult to define, but have described a progressive reversal from food production to non-productive activities (Ilbery & Bowler, 1998; Symes, 1992). On-farm change is described as the restoration and conservation of the environment and the introduction of diversification (Ilbery & Bowler, 1998; Symes, 1992). Examples of activities put forward for family farmers are the generation of income through the set-up of tourist accommodation such as a bed and breakfast or caravan site, pick-your-own schemes, or undertaking part-time employment off the farm (see Evans & Ilbery, 1992). Supporters also suggest that income may be created through involvement in agri-environmental schemes, where practices to conserve the rural environment such as creating hedgerows, ponds or meadows are rewarded with subsidies (see Morris & Potter, 1995; Battershill & Gilg, 1996). As a result, post-productivism appears to offer a range of activities which may replace the dependence of the family farm on acquiring funding and technology to increase their production in order to survive. Indeed, Symes (1992) and Drummond *et al.* (2000) argue that the success of post-productivism as a conceptual framework is dependent on the implementation of these changes specifically on family farms.

However, post-productivism has received substantial criticism from within agricultural geography (see for example Evans *et al.*, 2002; Wilson,

2001; Wilson & Rigg, 2003). A significant amount of this criticism is levied on the fact that the activities advocated by post-productivism have not been perceived by farmers as valid options for implementation. For example, Drummond *et al.* (2000) and Evans *et al.* (2002) argue that despite the potential for income through agri-environmental subsidies and diversification activities, family farmers have not adopted this change as a complete alternative to food production. This is because farmers have retained an outlook, ethos or mindset which is productivist (Burton, 2004; Burton *et al.*, 2008). This has resulted in farmers incorporating environmental conservation with food production. For example, family farmers may set aside some of their land to create a meadow to create additional income, but simultaneously increase the intensity of production on other land (Evans, 2009). As Evans *et al.* (2002) argue, this questions the validity of post-productivism as a concept for theorising agricultural change. Consequently, it does not provide realistic or viable opportunities for the family farm to sustain or improve its survival prospects.

Multifunctionality refers to a type of agriculture which supports food production within a broader range of other activities such as environmental conservation, diversification, the sustainable use of resources, the creation of employment opportunities and rural development (Potter and Burney, 2002; Potter & Tilzey, 2005; Wilson, 2007; Shucksmith, 2010; Holmes, 2006; McCarthy, 2005). Definitions are based on theoretical approaches concerned with a holistic view of agriculture that emphasises change or transition, the role of wider cultural processes, a productivist/non-productivist spectrum and the role

of individual farmer's decision-making (see Wilson, 2007; Van Huylenbroek & Durand, 2003). Multifunctionality offers family farmers the chance to continue their productivist activities alongside non-productivist ones. For example, a single family farm may grow crops and rear livestock, while setting-aside some land for an agri-environmental scheme, running a bed and breakfast and preserving a woodland area. Consequently, multifunctionality means that family farmers can embrace both productivist and non-productivist agriculture to select from a great number of activities those which offer the best financial, cultural, social and environmental return for the family farm. As a result, multifunctionality has been described as a 'palliative' for the pressure imposed by the demand for sole food production achieved with credit and technology (Marsden & Sonnino, 2008, p.423). Moreover, Marsden and Sonnino (2008, p.423; my emphasis; see also Woods, 2011; Wilson, 2008) write that multifunctionality can be interpreted 'as a *survival strategy* that helps the least productive farmers to combat increasingly harsh market conditions'.

However, Wilson (1997) states that the engagement of family farmers with multifunctional agriculture is dependent on their connections with external forces of change such as policy, the demands of organisations such as food processors and retailers, and the market. For example, agricultural and rural geographers such as Woods (2011), Marsden and Sonnino (2008) and Potter and Burney (2002) have investigated the way in which the EU has promoted farm diversification in order to create a more multifunctional agricultural sector. This means that while family farmers have the potential to engage in a range of farming activities such as conservation and creating rural employment, their choices are restricted by the requirements of these forces

(Wilson, 2007, 2008). Despite efforts to include multifunctional or non-productivist goals, these forces still command food production. For example, a relatively small amount (27%) of EU funding is given to agri-environmental policy compared to subsidies for food production (Evans *et al.* 2002). As a result, despite the multifunctional options available to them, external forces mean that the survival of family farming is still tied to productivism.

Organic farming is the production of food without the use of agri-chemicals such as pesticides and fertilizers (Tovey, 1997). However, this form of farming is based on a set of ideologies that emphasise local and quality food, less intensive farming, a closer relationship between production and consumption, environmental conservation, support for skilled farmers, and the 'rebuilding [of] rural communities' (Tovey, 1997, p.25). For example, the definition of organic farming adopted by the Soil Association (2013) does not refer specifically to the non-use of agri-chemicals, but more broadly to the use of 'environmentally and animal friendly farming methods'. For family farmers, the decreasing importance of intensive production removes the need to increase continually production to survive. Instead, family farmers are encouraged to farm creatively to produce relatively small amounts without using agri-chemicals, which they sell through local outlets such as town shops or farmers' markets. The products attract a premium price as consumers value their quality, local origin, skilled or artisan production and role in the protection of wildlife susceptible to the effects of pesticides. Additional finance is also available for family farmers through agri-environmental schemes, which give subsidies for organic farming and other practices which conserve the

environment (see Tovey, 1997; Natural England 2014c). Consequently, organic farming re-casts family farmers as knowledgeable producers of quality food and stewards of the countryside, activities which generate a premium income and ensure survival.

The interpretation of organic farming as localised, non-intensive food production by family farmers who act as harbingers of the countryside has been contested. Rather, some geographers have highlighted the role of organic farming in furthering productivism. For example, Ilbery *et al.* (1999) observe that the organic sector is becoming highly concentrated in some areas of England. In some instances, this has placed organic farming in conflict with goals to conserve and protect the environment (Tovey, 1997). This concentration is supported by the introduction of technology such as biological fertilizers, which require investment (see Tovey, 1997, 2001). This dependence on access to technology and funding means that family farms are required to intensively produce. As a result, family farmers have the same prospects for survival as those experienced under productivism.

The conceptualisations of three types of agriculture that emerged following the early-mid 1980s - post-productivism, multi-functionality and organic farming - seem to highlight a range of different activities for family farmers. These activities are either considered a complete alternative to sole food production (post-productivism), a different type of food production (organic farming) or a supplement to food production (multifunctionality). As a result, they appear to offer a new prospect of survival for the family farm. This is in

direct contrast to the hypotheses of extinction of the family farm prevalent during the era of productivism.

However, analysis within this section has shown that these activities have not been perceived or implemented by family farmers in a way that challenges food production. For example, while family farmers have adopted some of the ideas associated with post-productivism, such as setting up tourist accommodation or pick-your-own schemes, their productivist mindset means that this is only done to manage land or finances in order to continue/increase food production. Activities associated with multifunctionality (such as the sustainable use of on-farm resources or conservation) are appealing to family farmers, but guidance of their choices by external forces (e.g. policy) means that implementation can be difficult. The scope to add value to farm goods by converting to organic farming seems positive, but access to the finance and technology required raises the same challenges for family farmers as those experienced under productivism. As a result, these activities have not offered real opportunities for family farmers to move away from producing food to remain in business. Consequently, the significance of the tools of technology and external connections emphasised under the post-war productivist era has not been challenged. Therefore, there remains significant potential to investigate the practices undertaken by family farmers to survive. This must consider the possibility that they have found a way to use technology and external connections that does not threaten their survival.

2.4 Anticipations of future agricultural change and the family farm

The last 5 years have seen an increasing awareness of worldwide issues that will challenge the availability, accessibility and cost of food within the UK such as climate change and an increasing population. These issues have been outlined in several reports that have been published by Chatham House (Ambler-Edwards *et al.*, 2009), The Royal Society (2009), The Smith Institute (Bridge & Johnson, 2009) and Foresight (2011). These organisations draw on research to produce information and recommendations for the UK Government.

Bridge (2009, p.6) writes, 'this core challenge – how we feed ourselves in the future – points to the need for new thinking, new policies and possible changes in existing international institutions in order to meet what is generally agreed to be a very serious challenge to the global food economy'. Foresight (2011, p.34) also emphasise, 'decisive action is needed across a wide front'. This entails the creation of a new agri-food system.

The new agri-food system involves the fulfilment of a wide range of often clashing objectives. Ambler-Edwards *et al.* (2009, p.5) write that the new agri-food system must reconcile 'resilience, sustainability and competitiveness'. Resilience refers to the assurance of long-term and secure availability of food an awareness of areas or risk, productivity and the management of imports and exports (Ambler-Edwards *et al.*, 2009). Sustainability will mean the use of decreased and recycled inputs to produce 'safe, healthy food with positive social benefits and low environmental impacts' (Ambler-Edwards *et al.*, 2009, p.26). Competitiveness will involve managing the cost of inputs, workforce and environmental impacts to produce

food at affordable prices for consumers (Ambler-Edwards *et al.*, 2009). It must also manage and satisfy the expectations of consumers on the variety, cost and ethical/environmental credentials of products (Ambler-Edwards *et al.*, 2009). Foresight (2011) write that the new agri-food system will involve changes to the currently 'self-organised collection of interacting parts' including production, processing, packaging and retail. For example, consumers may need to pay more for their food and see the year round availability of particular foods such as strawberries or apples decrease. Bridge (2009, p.7) emphasises that customers should anticipate 'almost certainly higher average prices for [...] foods'. Retailers will be expected to uphold ethical, environmental and sustainable values through the selection and labelling of products visible to customers (Ambler-Edwards *et al.*, 2009).

Changes to food production set out in the new system are centred on increasing production in ways that environmentally sustainable. Ambler-Edwards *et al.* (2009) discuss how sustainable methods must be used to increase agricultural productivity. The Royal Society (2009, p.46) provide further clarification through the use the term 'sustainable intensification' to mean 'the production of more food on a sustainable basis with minimal use of additional land'. A sustainable basis denotes production 'without adverse environmental impact' (The Royal Society, 2009, p.ix). Increased production will be achieved by farmers intensifying their practice to produce amounts above thresholds that have previously been imposed by CAP policy reform. This will relate to an 'increase in farm scale along with separation of ownership and production' (Ambler-Edwards *et al.*, 2009, p.34). Increased environmental sustainability will involve a reduction in the use of energy

derived from fossil fuels (e.g. oil), fertilizers and other agri-chemicals.

Greenhouse emissions and waste outputs will be minimised. This will be supported by policy which will connect farm payments and subsidies to 'sustainable production practices' (Ambler-Edwards *et al.*, 2009, p.34).

The implementation of the new agri-food system is centred on the use of current and developing forms of technology (Ambler-Edwards *et al.*, 2009). Current technologies must be used in more conservative ways, which do not negatively impact on levels of output. For example, rather than spreading fertilizer across an entire field, farmers may only apply it to the areas that are most deficient. Materials such as plastic sheeting or twine may also be recycled to use again. Important emerging technologies include those that aid the reduction of resource consumption, enable farmers to be more efficient with their time and labour, or contribute to the recycling of waste. Examples include precision-applicators (which allow agri-chemicals to be applied to specific areas), methane digesters (which process organic material, thereby reducing emissions of greenhouse gas), controlled-release fertilizer formulas, drip irrigation systems (which reduce water use) and 'green fertilizer' (biomass produced from recycled waste) (Ambler-Edwards *et al.*, 2009, p.28). In addition, the think-tanks argue that the debate surrounding genetic modification must be re-opened. This vociferous and contentious debate is focused on objections concerned with: the preservation of biodiversity; the problematic co-existence of GM and non-GM food; traceability and labelling of GM ingredients; the ownership of GM technology; and GM organisms and human health. Ambler-Edwards *et al.* (2009) argue that these objections must be overcome as genetic modification will be a key tool in the reconciliation of

increased production and environmental sustainability. For example, genetic modification may be used to produce disease-resistant crops which will increase the amount of yield that can be produced without the need for fertilizers.

It is envisaged that farmers will introduce these new practices and technologies by utilising their connections with other businesses, organisations and individuals (e.g. policy makers) within the whole agri-food system (Foresight, 2011). These connections have already led to the establishment of technical ability, technological knowledge and practice. Foresight (2011, p.10) states that 'much can be achieved immediately with current technologies and knowledge given sufficient will and investment'. Bridge (2009, p.9) writes that there is 'potential [here] to increase food output within current technical constraints and scientific knowledge'. In terms of funding, Ambler-Edwards *et al.* (2009, p.33) emphasise the role of the Government in conducting 'an urgent review of the level of public funding required'. They recommend that this results in 'support for research-based institutes and help in developing the private-public partnership frameworks needed to support technology transfer, particularly across the agricultural base' (Ambler-Edwards *et al.*, 2009, p.33). These changes will result in a separation of production and ownership on farms (Ambler-Edwards *et al.*, 2009). This will encourage farmers to become more 'business savvy' and perceive their farm and its activity as a competitive money-making enterprise, rather than a way to maintain a family home or way of life (Ambler-Edwards *et al.*, 2009).

Agricultural geographers have begun to conceptualise these proposed changes to the agri-food system. Criticism of alternative forms of agriculture (e.g. post-productivism, multifunctionality and organic farming) and the emphasis on the need to produce more food has led some to suggest 'that productivism is not only still in existence, but in some places is making somewhat of a comeback' (Burton & Wilson, 2012, p.54; see also Evans *et al.*, 2002). This has resulted in a conceptualisation of 'super-productivism', where farmers will utilise their connections with external organisations on a global scale to reach new levels of food production (Halfacree, 1999; Marsden, 2003; Burton & Wilson, 2012). However, this neglects the emphasis on environmental conservation and sustainability that is present in the discussions of the political think-tanks about the new agri-food system. This has led to theorisations of 'neo-productivism', which is a term used to denote increased but *moderated* food production. In this context, moderation may mean production through integrated or organic farming (Evans *et al.*, 2002), the effective long-term application of resources (Ilbery & Maye, 2010) or alongside the continuation of non-productive activities such as diversification or agri-environmental schemes (Marsden & Sonnino, 2008). New forms of technology, including genetic modification, are considered essential to the implementation of neo-productivism (Ilbery & Maye, 2010).

These early theorisations are useful predictions of future agricultural change. However, it is still unclear how these predictions will become an actual reflection of the agricultural sector of the UK (Maye & Kirwan, 2013). This is considered particularly challenging as the two key objectives of neo-productivism – increased production and environmental conservation – often

exist in opposition where one has a negative impact on the other (Maye & Kirwan, 2013; Sage, 2013). Another potential problem is the distribution of power within a neo-productivist system. For example, the increased production of food (especially if changes to UK agricultural policy result in subsidisation) could mean significant economic gains for powerful agribusinesses and corporations (Sage, 2013). This might mean that activities to conserve the environment carried out by less influential organisations are neglected. The power wielded by organisations who create and copyright technology (such as Monsanto and genetic modification) on farmers has also attracted attention (see Pechlaner & Otero, 2008). A further issue is the lack of consideration afforded to identifying the particular foods that will be produced because they are viable, nutritious and appealing to consumers (Kirwan & Maye, 2013; Sage, 2013).

It has been argued that the detailed realisation of 'neo-productivism' is dependent on research that utilises a 'bottom-up' approach. These approaches seek to reveal the perspectives, opinions and actions of individual actors who exist at the base of agricultural change. These are placed within theoretical perspectives concerned with the relationship between agriculture or food production and the environment (agro-ecology), geography (localisation), farmers and other food producers (food sovereignty) and consumers (social justice or human rights) (Kirwan & Maye, 2013). For example, Anderson (2013, p.119) argues that conceptualising access to sufficient and healthy food in the United States as a human right or form of social justice would highlight and tackle the 'root causes' of current barriers within society. These include the varied access to food experienced by

individuals of different ethnicities and wage, and the role of corporations in creating cheap food of little nutritional value (Anderson, 2013). There has also been an application of these theoretical approaches to the opinions of farmers on neo-productivism (Lawrence, 2013; Rosin, 2013). For example, Fish *et al.* (2013) used a survey and polling methodology to investigate the perspectives of farmers on food security. They concluded that while farmers' perceptions and views are diverse and contingent, 'most [of their] participants aligned themselves with the normative goal of increasing the productive capacity of UK land resources, and widely assert that this concern has to be reconciled with wider sustainability concerns' (Fish *et al.*, 2013, p.49). There has also been some consideration of the opinions of farmers on particular technologies associated with neo-productivism. For example, The Open University (2007) used interviews, discussions and workshops to explore the thoughts and potential decisions of farmers on genetic modification. This research found that in contrast to the often contentious debates centred on genetic modification, farmers did not perceive the technology to be 'completely novel' but introductions 'to be assessed on their merits in the light of their own farming context and experience' (The Open University, 2007, p.3). Moreover, farmers considered genetic modification to be particularly useful to reconciling the aims of increasing food production and conserving the environment under neo-productivism (The Open University, 2007). Other research has also begun to unpick the ways in which other technologies such as robotic milkers and Spanish polytunnels might become a reality for farmers under neo-productivism (Evans, 2013). This work has added substantial detail, focus and a sense of reality to the key elements of neo-productivism.

This section has explored anticipations of future change to the UK agri-food system, which have been triggered by an awareness of global issues such as climate change and fluctuating food prices. Some organisations have recommended that the system works to produce an increased amount of food using methods that are environmentally sustainable (Ambler-Edwards *et al.*, 2009). They propose that these changes will be achieved through the primary tool of agricultural technology. The introduction of this technology on farms will be supported by funding and knowledge acquired through off-farm elements of the agri-food system such as private research institutes. The section also explored how agricultural geographers have begun to unpack these changes for the UK agricultural sector and conceptualise them as a phase of 'neo-productivism'. Criticism of this work highlighted that there was a significant gap in knowledge of the nuance and detail of neo-productivism. Subsequent investigations into the perspectives of various actors in the agri-food system such as consumers and farmers has offered key insights. However, there remains potential to consider how neo-productivism and the tools of its implementation, technology and connections with external off-farm entities, will impact the family farm. Under post-war productivism, agricultural geographers hypothesised that these tools would destroy the family farm, so it is pertinent that the family farm and its survival are investigated.

This chapter has discussed the historical, academic and disciplinary context for this research. It has explored attempts to define the family farm and analyse its significance within different phases of agricultural changes since

the Second World War. Literature on the era of post-war productivism emphasised the importance of technology and external connections to successful farms. Commentators argued the family farmers lack of access to these tools would lead to their demise. However, analysis of subsequent phases of agricultural such as multifunctionality and organic farming suggested found that they offer little real opportunity for family farmers to engage with alternative tools. As such, it is reasonable to argue that farm families have adjusted their practices, relationships and decision-making to find ways to utilise these tools in order to maintain their success and survive. This has formed the justification for an investigation into the family farm and the tools it has utilised for continuation. Predications of agricultural change known as neo-productivism has added a sense of relevance and urgency to this research. The following chapter begins with a critique of the theories that have been used to think about the family farm and its survival such as the technological treadmill and subsumption. Alongside an exploration of recent and innovative theoretical work into these issues such as technological knowledge-practices, this enables the construction of a conceptual framework for this study.

CHAPTER 3: CONCEPTUAL FRAMEWORK

This chapter outlines the conceptual framework of this PhD thesis. It explores and critiques theoretical literature in agricultural geography which has been used to conceptualise the family farm and its relationships with technology and external entities. It also considers how these tools have been considered in terms of the strategies for survival adopted by family farmers. The chapter argues that these offer perspectives that do not appreciate the real autonomy of family farmers and their use of tools to forge their own intricate lives and futures. The chapter then outlines how more recent innovative theoretical work can be applied to the context of the family farm and its use of technology and external connections. It then considers how these conceptualisations can be used to explore the reasons behind the survival of the family farm.

Chapter 2 argued that the family farm and its survival has not received adequate academic attention from within agricultural geography. This is particularly significant considering anticipated changes to the agricultural policy context. This is due to hypotheses of their demise during post-war productivism, which were based on their inability to access funding for technology through external connections with organisations such as banks. However, while the numbers of family farms have decreased, complete extinction has not occurred. Subsequent forms of agriculture and policy signals (e.g. multifunctionality, organic farming and agri-environmental schemes) have not provided realistic opportunities for family farmers to move away from productivism and therefore do not explain their survival. Consequently, family farmers must have found a way to shape their enterprise, adopt technology and engage with external entities, in order

produce food and persist. This study is based on exploring these three tools; the internal dynamics of the family farm, the use of technology within the family farm and the external connections of the family farm; and their role in the survival of the family farm. This chapter provides a theoretical framework for thinking about these survival tools. It is split into four sections.

The first section is concerned with identifying the internal dynamics of the family farm. The most recent definition of the family within agricultural geography provided by Gasson and Errington (1993) is outdated and predominantly focused on identifying family farm characteristics that are driven by an economic or business perspective. It lacks an awareness of the contingency, diversity and personal experience of family farmers. This chapter draws upon the enculturing of agricultural geography to prioritise the different, every day and mundane activities that are undertaken on a family farm. It is concerned that these activities are carried out to fulfil a variety of motivations such as undertaking the husbandry of particular livestock breeds, generating an income and producing food. It also relates these actions and motivations to aims that exist at a deeper level within farm family members. Providing a framework to analyse everyday activities to identify these structures enables key insights into the family farm.

The second part is about theorising the processes by which technologies are perceived, adopted and used within the context of the family farm. Conceptualisations during post-war productivism focused on how farm families' could not adopt technology and, as a result, would struggle to survive. These arguments fail to recognise the agency of family farmers and the different ways in which technologies are developed and used. This

conceptual chapter works from the premise that family farmers can access technology and prioritises the processes by which they understand, introduce and use them. It considers that these processes are related to deeper concerns with issues such as 'fitting in' technology with the context of the whole family farm and improving its self-sufficiency. This part of the conceptual framework applies and relates theoretical insights into technological knowledge-practices to the context of the family farm.

Part three of the conceptual framework is focused on the external connections that family farmers create, maintain and destroy. Literature published during the era of post-war productivism details how farm families' lack of external connections meant that they could not afford to adopt technology, which led to their demise. Alternative perspectives argued that farm families might survive, but that the necessity to connect with external agencies within the agri-food system would mean that their control and ownership would be diminished to such an extent that they would no longer be a 'family farm'. This literature has been criticised for its lack of account of the agency of family farmers and the complexity of relationships between individuals, businesses and concerns within the agricultural sector.

Consequently, this section of the conceptual framework recognises that farm families *do* have external connections and emphasises the need to identify and explore them. It also draws on work that has investigated connections within the rural landscape such as that on 'networks' (Murdoch, 2000). It considers that the significance of these external connections is related to the underlying motivations of family farmers, such as the desire to preserve the knowledge held by the farming community. This part of the theoretical

framework allows for fulfilment of the gap in knowledge highlighted by conceptualisations of farm networks and knowledge-cultures, to investigate the external relationships that radiate from farm families.

Finally, part four is concerned with how the three tools interact in a way that promotes the survival of the family farm. Agricultural geographers have explored how family farmers plan and follow survival strategies. Building on the work that analyses post-war productivism, these survival strategies do not involve technology or external connections, but activities such as diversification and off-farm employment that are associated with alternative forms of agriculture. These strategies may be critiqued on the basis that they consider farming activities, success and survival purely in economic terms, which fails to account for the choices and motivations of family farmers themselves. This element draws on research into rural resilience and farming emotion to theorise survival as a concept that is deeply embedded within the experiences and desires of family farmers.

The four elements of the conceptual framework indicate the importance of the connections between visible action, spoken motivations and underlying desires or longings. For example, the researcher may observe a technology being adapted to perform another function, listen to the motivation to spend less on purchasing lots of similar technology, which reveals a deep longing to continue farming or 'to keep the name on the land'.

3.1 Internal dynamics of the family farm

The literature review discussed the definition of the family farm published by Gasson and Errington in 1993. The definition used a primarily economic

approach to create a definition composed of six key elements, as discussed in Chapter 2. This definition has proved very useful to agricultural geographers helping to set out what is meant by the 'family farm' prior to discussing research into issues such as agri-environmental policy and the role of gender in distributing farm work. While it has proved useful to agricultural geographers, Chapter 2 remarked that the definition is now outdated and that the family farm requires re-conceptualisation. Moreover, there are seven significant ways in which the definition can be critiqued:

1. There is little account of the process by which the objectives or ethos of the family farm feed into their decisions, practices and activities. For example, Gasson and Errington (1993) highlight the importance of the inter-generational transfer of assets and control but do not delve into how this contributes to decisions to, for example, improve buildings or invest in new enterprises. Lobley, Baker and Whitehead's (2010) study of farm succession and retirement suggests that this is important. The state of farming as 'a largely inherited occupation' means that the inter-generational transfer of assets and control 'is arguably one of the most critical stages in the development of the business' (Lobley, Baker & Whitehead, 2010, p.50). As a result, family farmers plan and prepare for this eventuality by undergoing processes such as blurring the labour roles of family members such as those of the principal and his offspring in the years preceding the transfer. This recommendation had been made by Whatmore *et al.* (1987b, p.103).

2. Gasson and Errington's (1993) definition of the family farm is focused on the (male) principal of the family farm, which neglects other individuals and non-human animals. Geographers such as Price and Evans (2005, 2006), Bennett (2004) and O'Hara (1998) have argued for the need to account for the roles and work of women on family farms. For example, women may carry out book-keeping, tend young livestock or provide finance through a part-time job off the farm (see O'Hara 1998; Evans & Price, 2005, 2006). In addition, geographers such as Philo (1992), Matthews *et al.* (2000) and Riley (2009) have argued that the place of children in farming has been marginalised. Matthews *et al.* (2000) began to fulfil this research potential by using the methods of a questionnaire and semi-structured interviewing to glean the perspectives of children aged between 9-16 years on living in the countryside (see also Giddings & Yarwood, 2005; McCormack, 2002). However, Riley (2009) focuses further by considering children living on farms. Adopting an ethnographic approach, Riley (2009) uses the methods of farm life history and serial interviewing alongside participant observation to reveal the importance of children's practices, roles and identities on the farm (see also Riley, 2011). The need to explore interactions between family members and animals on the farm has also been emphasised (Yarwood & Evans, 2000; Holloway, Riley, 2011). For example, Riley (2011) discusses how farm families imbue their animals with character and personality. Moreover, these interactions can be two-way or even multi-directional. For example, Gray (1998) explores how the inter-generational transfer of farms by families in the Scottish borders reflects the grazing practices of their sheep that remain on the same tract of land over generations. Moreover, research on new agricultural technology such as

genetic cloning and robotic milking has revealed co-constituted relationships between farmers, breeders, animals and technology (Morris & Holloway, 2014; Butler *et al.*, 2012).

3. Gasson and Errington's (1993) definition does not depict the contingency of the family farm over time. Elements such as the roles of family members and their location on the farm are emphasised, but how they may change over time is not explored. For example, the family life cycle may mean that the labour roles of ageing individuals become less demanding and physical, or the role of a child in tending young calves becomes redundant when the animals grow. PhD research conducted by Williams (2010) showed how varied the process of succession can be in practice. Moreover, following their study of farmers in South East England, Morris and Potter (1995, p. 59) highlighted the influence of 'changes to the farm and family situation' to farmers considering becoming involved in agri-environmental schemes. One farmer suggested that while he/she was not currently interested in participating in an agri-environmental scheme, change to the profitability of their current farming enterprises may encourage them to re-consider (Morris & Potter, 1995). The family farm will also undergo change within a year as particular seasons and months mark the times for activities such as crop planting and harvesting, sheep tugging and lambing etc.

4. The definition put forward by Gasson and Errington (1993) prioritises the identification of economically-driven individuals and processes. This means that their definition does not engage with the social life of the family farm,

such as time spent on recreation or leisure activities. For example family farmers may visit local shops, participate in events such as village fairs or shows and meet with friends at the pub. Moreover, there is no consideration of the social or recreation time of family members may be integrated with farm work. For example, the family may socialise alongside completing farm work by telling stories, sharing jokes or stopping for a tea break. To fulfil potential, the ordinary, mundane and leisure aspects of family farming is central to this thesis.

5. Gasson and Errington's (1993, p.22) definition of the family farm refers to 'farm work' but it does not explain what this means in terms of individual tasks or jobs. As a result, the potential for a detailed account of the everyday mundane practices and tasks that are undertaken by family members on their farm is a focus within this PhD. Moreover, it would be useful to consider how these jobs are grouped together to form a daily or seasonal routine that contributes to the fulfilment of the broader objectives and goals of the family farm.

6. The work of geographers looking at issues such as agri-environmental policy, farm succession and pluriactivity provides valuable insights into the definition of a family farm. For example, Lobley *et al.* (2010) explore the processes that underlie the family farm's defining elements, such as the blurring of labour roles that precedes inter-generational transfer. However, Lobley, Baker and Whitehead's (2010) article is wholly focused on farm

succession and retirement, so there is a significant potential to conduct similar investigation of the other elements that define the family farm.

7. Gasson and Errington's (1993) definition of a family farm business states that the farm family must provide and control capital on the family farm (see section 2.1). The importance of this element of the farm family business might be considered to be 'moderate', because on the left of the pictorial representation of the definition (Figure 2), it sits between the more important requirement that principals are related by kinship or marriage and the less significant criteria that they live on the farm. However, research guided by the cultural turn in geography suggests that family farmers' motivations to produce profit or capital are even less significant than first thought by Gasson and Errington (1993). There is scope to look closely at this research to explore the different and alternative objectives of farm families, which may include 'improving' the condition of the farm or developing a cohort of livestock.

This critique provides justification for moving away from perspectives that are either explicitly or implicitly driven by economics, to establish a different approach to conceptualising the family farm for agricultural geography. Since the publication of Gasson and Errington's (1993) definition, agricultural geography has increasingly come under the influence of the cultural turn in human geography, which emphasises the role of culture and society to the actions of farmers. This has inspired some rural and agricultural geographers to draw on the philosophical writings of key social theorists such as Bourdieu

(1984) to conceptualise farmers' interest in non-economically driven activities such as rearing particular breeds of sheep or ploughing in parallel lines (Yarwood & Evans, 2006; Burton & Paragahawewa, 2011). This work indicates clearly that farmers' practices are varied, detailed and occasionally unexpected. It also shows that practice defines the everyday, mundane and subconscious life of a farm family. Consequently, this study prioritises the experience, analysis and interpretation of activities that take place every day within a family farm.

A closer look at farmer's actions has led to some critical thinking about the motivations that lie behind them. These may be influenced by aspects of the human condition such as gender, perceptions of 'home', relationships with land and a sense of independence as well as economics (Gray, 1996; Riley, 2014; Brandth & Haugen, 2012, Price & Evans, 2005). The following bullet list details the 8 most prominent motivations that emerged from a critical analysis of this literature.

i) Maintaining the kinship of the farm family.

Family farmers' are motivated to preserve their unit of personal relationships by 'showing respect, 'getting along' and taking care of each other. Riley (2014) discusses how current prominent discourses in society suggest that when individuals reach a certain age they become less active, struggle to fulfil a clear work role and are unable to maintain the same level of productivity. At this point, they retire and are replaced by a younger individual. However, farm families challenge these discourses by recognising that the work carried out by everyone is part of a collective or 'team effort', which challenges the idea

that ageing members undertake and produce less (Riley, 2014, p.244). Moreover, if this idea were not rejected and ageing members simply retired, their work (albeit less) would need to be completed either by another farm family member or by an unrelated paid worker. This may be problematic because the younger worker may not have the same skills or experience as their older counterpart. In addition, as the life cycle progresses, younger workers will themselves become older which means that this is not a permanent solution. The recruitment of younger family or non-family labour might increase productivity and profits, but it is not therefore without costs or implications. In addition, on a more abstract level, retirement is perceived as an issue or decision that affects the whole farm family rather than a single member (Barnes & Parry, 2004). For example, retirement is considered part of the broader process of succession, where decisions on the re-distribution of particular roles and responsibilities are made by the whole farm family. This active interest in the continuation of the role, work (albeit reduced) and perspectives of ageing members indicates that the motivation to preserve the 'farm family' is more important than the creation of profit.

ii) Maintaining a relationship between the farm family and the land.

Within social anthropology, Gray (1996) has used a cultural approach, which arguably defines the discipline, to investigate family farming in Teviothead, Northumberland. This is an area characterised by hill sheep farming on the border between Scotland and England. Through his ethnography, in a study area where 'all but one of the farms were family owned', Gray (1996)

uncovered a complex symbiotic relationship between the farm families and their sheep. The breeds of sheep reared in the area due to characteristics such as breeding instinct and resilience in harsh winters retained the same area of grazing land across generations (Gray, 1996). Gray (1996, p.42) observed that this is 'embedded in the concept of 'keeping the farm in the family' for this too entails a descent-based succession of humans whose identity is associated with a specific area of land'. While the area in which Gray (1996) worked pre-disposed the selection of a particular sheep breed, this motivation to 'keep the name on the land' has also been identified as important to farm families in other geographical contexts (see Potter & Loble, 1992; Riley, 2014; Price & Conn, 2012).

iii) Conserving a way of life.

Agricultural geographers such as Price and Evans (2009) have explored the notion of family farming as a 'way of life'. This is connected to the idea that family farming exists as a key construct within the rural idyll where there is a quiet and unpolluted environment, a network of neighbourly or community contacts and a close relationship with nature (Bryant & Pini, 2011). Efforts to preserve or even re-imagine this way of this way of life have emerged in work that has considered the involvement of farm families in work such as providing on-farm accommodation for tourists. For example, Brandth and Haugen (2012) describe how some farm families who provide tourist accommodation emphasise the idea of the rural idyll that their visitors find attractive by introducing chickens to the farm yard, talking about the daily tasks and jobs, and offering freshly baked bread. Receiving payment through this

commodification of the family farm and re-creation of the past may be seen to inauthentic and even undermine the 'true' way of life. This (re) invention blurs the boundaries between the reality and truth of family farming (Fish *et al.*, 2001). However, while tourists perceive their stay as an experience of the farm family way of life, Brandth and Haugen (2012) highlight the attempts of some of their hosts to maintain a boundary between their 'home' and tourist 'business' (e.g. by creating separate areas such as a 'reception'). Moreover, Chapter 2 discussed that farm tourism and other non-productive activities have not allowed or encouraged family farmers to abandon production (Evans & Ilbery, 1992). This suggests that tourist enterprises should be perceived alongside other non or low productive activities, such as rearing rare or particular breeds/bloodlines or participating in agricultural shows, which are not primarily undertaken to generate capital but to enhance the social and cultural aspects of family farming (Yarwood & Evans, 2006; Holloway, 2004). This is illustrated in Brandth and Haugen's (2012) observation that some family farmers who provide tourist accommodation enjoy meeting others who are interested to learn about experience their work and life. Consequently, an important motivation for family farming is appreciating and conserving the way of life it encapsulates.

iv) Maintaining patriarchal organisation.

Patriarchal structures and systems have a long-standing presence within agriculture (Price & Evans, 2006; Price, 2010; Cassidy & McGrath, 2006). For example, the succession and inheritance of the family farm from father to son is perceived as an expected or natural course of events (Price & Evans,

2006). This is supported by non-successors as, while they stand to inherit very little or even nothing, they act to uphold this process. For example, it has been documented that women contribute significantly to the family farm through bringing up children, undertaking off-farm employment and on-farm diversification activities even though this is often little or entirely unrecognised (Price & Evans, 2006; Shortall, 2002). In addition, Haugen *et al.* (2014) highlight that during a divorce settlement, some farm women are reluctant to invoke their legal claims if there is risk to the continuation of the family farm. Non-successors within the farm family, such as the siblings of an heir, may also act to support this outcome. For example, Cassidy and McGrath (2014, p.405) describe that despite the fact that non-successors have a detailed knowledge and emotional connection to the family farm where they grew up, they consider it 'inappropriate' to succeed or gain financially from it. As such, they did not show resentment at their unequal inheritance, but justified it with reasons such as their lack of interest in farming or movement into higher education (Cassidy & McGrath, 2014). The importance of (patriarchal) farm succession has also been reflected in agricultural policies which have attempted to support the process of 'farm transfer and early retirement schemes' (Riley, 2014, p.239; see also Ingram & Kirwan, 2011). The motivation to support patriarchal structures and succession is therefore very strong within family farming.

v) Being independent and in control.

Farm families have a keen interest in maintaining their independence through the ownership, management and control of their assets, activities, routines,

and decision-making processes. This is shown in the work of Riley (2014) who describes how if there is a need for extra capital, family farmers will prefer sources which enable them to stay within the vicinity. For example, Riley (2014) discusses one semi-retired farmer who prefers to add his pension into the farm finances, than have his son undertake off-farm employment. This is also reflected in Brandth and Haugen's (2012, p.184) work on the establishment of tourist enterprises on family farms, which they argue is 'motivated by a wish to be self-employed rather than seeking off-farm employment, which would have been the most realistic alternative' (see also Brandth & Haugen, 2011). This indicates that while creating sufficient finance is important, this is off-set or works alongside the motivation to retain all members of the farm family on site which supports their independence. This provides a significant critique of the work of Whatmore *et al.* (1987a&b) which argues that farm families will lose their independence as they become increasingly reliant on resources (e.g. funding) from external bodies such as banks and gradually subsumed into the broader agri-food system (see Chapter 2 for more detail).

vi) Being a 'good', 'tidy' farmer.

Family farmers are concerned with undertaking practices that show them to be responsible, clean and proficient. For example, Burton and Paragahawewa (2011) observe farmers who ensure that they plough in straight parallel lines of a consistent depth and width. On a practical level this approach to ploughing has the purpose of enabling the even spread of fertilizer and seeds, which allows crops equal access to resources such as nutrients, light and

water. However, Burton and Paragahawewa (2011, p.99) use the cultural approach to highlight that this practice also reflects a conscientious mind set and motivation to acquire 'embodied skills that enable the farmer to be socially recognised as a 'good farmer''. For a farm family, this notion extends to all members and contributes to constructs such as the family's reputation or 'good name' within the community, which adds to their social capital. In addition, Riley (2014) writes that semi-retired family members often undertake jobs such as cleaning or organising the farm, to show that they are carrying out 'tidy farming' which is 'central to the identity of being a 'good farmer'' (Riley, 2014, p.244; see also Burton, 2004). There is a suggestion here that farmers could be very productive and in strong financial standing, but unless they take time to maintain the appearance of their farm, they will fail to be a good farmer. Caring for the farm in this way may also be conceptualised as a manifestation of the consubstantive relationship family farmers have with their land. As a result, the motivation to conduct particular activities in order to conform to this established farmer identity and consubstantial relationship with the land is very persuasive.

vii) Respecting the heritage and history of the farm.

Family farmers are concerned with maintaining the historical lineage of their farm. Riley (2014) writes that successes on the family farm are not perceived in isolation as a 'snapshot' in the current time, but as a product of years of actions carried out by generations (see also Gray, 1998). This has an impact on the understanding of the generation of profit, because good financial status in the present is related to the investments and sacrifices of the past.

Moreover, the current members of the family farm are not concerned with retaining good financial status, but in investing finance to ensure the future 'improvement' of the farm. This improvement might encompass efforts to produce more, participate in agricultural schemes or make farm work easier. To make these improvements a reality, family farmers would undertake activities such as applying agri-chemicals or establishing and growing a herd of cattle, creating a woodland area, and modifying an animal handling system. Each of these activities will take time, perhaps even years, to result in the envisaged improvements. This process of improvement is closely tied to the process of succession, because it is important for members to feel that they are passing on a family farm that is better than when they inherited it (Riley, 2014). As a result, family members are not motivated solely by increasing profits, but by how these are invested in the longer term health of the farm to benefit their future generations.

viii) Defining Goals as Production.

Family farmers are driven strongly by a goal to rear animals and cultivate crops to feed humans. For example, Evans (2009) writes that while some family farmers have engaged in agri-environmental policies which offer money for non-productive activities (e.g. maintaining meadows or widening hedgerows), they have chosen to simultaneously increase their crop or livestock farming in other areas. Other examples of the desire to produce were discussed in significant detail in Chapter 2, as it is one of the key reasons that has been attributed to the failure of non-productivism. However, when placed in the context of agricultural change, while production was

considered to be the single goal of farmers in the years following the Second World War, this sub-section has shown that farmers at the current time have a range of motivations. Consequently, it may be observed that production is a deeply engrained, but not exclusive, motivation of family farmers.

This account has illustrated the range and variety of motivations that are held by family farmers. This indicates that family farmers are not single-minded in their approach, but are able to work creatively to fulfil multiple objectives.

There are a variety of motivations, such as maintaining a relationship with the land and conserving a way of life, which do not directly relate to the creation of credit. In addition, investments and profits are understood as part of a project that lapses generations of family farm members, which means that perspectives relating to short-term capital accumulation and even annual profit / loss cycles fail to have any explanatory power. This supports the critique of Gasson and Errington's (1993) economically-driven definition and justifies the exploration of alternative approaches to understanding the family farm established as part of the cultural turn. In addition, some of the motivations that do relate to the generation of income suggest that this can be perceived in different ways. For example, the motivation to preserve independence indicates that income generated within the bounds of the family farm is considered more important than that from outside. This suggests that there is more complexity and nuance within the criteria requirement by Gasson and Errington (1993) to provide and control capital. Therefore, culturally informed approaches are not only able to highlight a variety of motivations, but are also effective at drawing out the detail of each one.

Consequently, this study is focused on utilising these theoretical perspectives to reveal the multiple and intricate motivations of the family farm.

This section has alluded to the need for a balance between the importance attributed to detailed practices and activities, and broader features such as motivations. Already published research in agricultural geography has led to a particular focus on motivations, but there may also be other broader characteristics on the family farm such as daily or seasonal routines. Evans (2009) refers to the need for this balance in his study of the adjustment strategies used by farmers in the Welsh Marches. Evans (2009, p.219) discusses how on-farm change can be understood by identifying 'building blocks' which can be overlain with 'qualitative material derived from agricultural approaches' (see also Morris & Evans, 2004). Evans (2009, p.220) also emphasises the importance 'of focusing on the connections between building blocks, especially if socio-cultural factors are integrated'. This early application of this theoretical balance between detailed intricate practices and broader structures or characteristics indicates its potential to researchers within agricultural geography. Applied to this part of the conceptual framework, this work shows how both the broad structure and detailed practices of the family farm can be appreciated. However, this study argues that the balance utilised by Evans (2009) should be reversed. Collecting the qualitative material first means that the building blocks can naturally emerge from the perceptions, practices and actions of farmers themselves. This means that subsequent analysis and conceptualisation of these building blocks into a perspective on the family farm remains grounded within their subjective experience.

In addition, this thesis seeks to relate this exploration of the family farm to its survival throughout periods of agricultural change. It wishes to consider that the practices and activities of the family farm, which are connected to broader building blocks or structures, exist to uphold a central aim. This aim is embedded and ingrained within the farm family and is focused on continuation and survival. Some of these connections have been illustrated through work on the motivations of the family farm. For example, the description of the motivation to maintain a relationship between the family farm and the land highlighted the connection with the notion of 'keeping the name on the land' (Gray, 1996). In addition, Riley (2014, p. 245, my emphasis) writes more strongly that this relationship is 'interlinked [with a] desire to continue [...] [and] a farming script which makes movement away from the farm, and the occupation of farming, an *inconceivable* act' (see also Riley, 2011, Silvasti, 2003). Moreover, the motivation to preserve the farm family which sees retirement and succession being of concern to all members has also been perceived as a manifestation of the rhetoric of survival and 'keeping the name on the land' (Potter & Loble, 1992; Riley, 2014). This research indicates the relationship between one of the 'building blocks', motivations, and the persistence of the family farm (Evans, 2009). However, this study is concerned with furthering this to identify the connections between the practice, broader characteristics and, ultimately, survival of the family farm through agricultural change.

3.2 Technology and the family farm

The literature review outlined how agricultural economists understood technology as an instrument of the destruction of the family farm. The concept of the technological treadmill was identified as essential to this process, as the increased ability of larger non-family owned farmers to adopt technology squeezed the profits of smaller family farms until they could no longer survive. The 'technological treadmill' concept gained significant currency amongst agricultural geographers. Ward (1993, p.350) writes that 'Cochrane's theory has been important in analysing the role of technological change in agrarian development'. The model proved to be particularly popular in the 1980s for agricultural geographers working from the perspective of political economy and its modification (modified political economy) (Ward, 1993). For example, Whatmore *et al.*'s (1987a,b) conceptualisation of farms within a political economy framework based on levels of subsumption under capitalism highlighted the role of the technological treadmill (see Chapter 2 and Chapter 3 for more detail on subsumption). Whatmore *et al.* (1987, p.28) write that 'the central mechanism by which formal subsumption has been realised is reflected in the growing dependence of the agricultural labour process on technological inputs, a development that has been termed the 'technological treadmill'.

The technological treadmill has also held importance for agricultural geographers looking at farming families and technology from more agency-orientated perspectives. For example, Pile's (1990) work on how dairy farmers relate to off-farm changes (in particular state policy change) highlights the significance of the technological treadmill. The treadmill is therefore not only

important as an abstract model, but for farmers themselves who 'experience and understand their [...] relations in terms of a treadmill' (Pile, 1990, p.135). As one of Pile's (1990, p.135) participants discussed, 'you've got to run faster to stay in the same place'. However, it is worth noting that Pile (1990) also describes how policy change, specifically the introduction of quotas which limit the production of dairy products, has undermined the technological treadmill. Pile (1990, p.137) writes that 'the (involuntary) 'drive' of the technological treadmill has been undermined by the State's withdrawal of its 'guarantee' of the accumulation process'.

Despite the significance of the concept of the technological treadmill in agricultural geography, it has seven significant limitations:

i) It is unclear what types of technologies are significant under the original concept of the technological treadmill outlined by Cochrane (1958). Although some examples are given, these are not discussed in depth or detail. For example, Cochrane (1958) briefly mentions hybrid seed corn. This is important as it highlights a presumption that all technologies produce increased outputs. Without increased outputs from technology, there would be no initial maintenance of farmers' profits, before over-production leads to dropping prices and the need to purchase more technology. However, Ward (1993) states that some of the most significant technologies in the years following the world war did not lead to increased outputs. For example, during the 1950s, the numbers of tractors on farms was 'rapidly growing', but 'tractors do not boost yields. They save labour' (Ward, 1993, p.351). As a

result, the technological treadmill is not a useful concept for explaining the range of technologies that were significant in agriculture at the time.

ii) The fact that the technological treadmill does not explain interactions with technologies that do not lead to increases in outputs reveals a presumption that farmers are only motivated by production (see Ward, 1993). However, literature in agricultural geography has highlighted that farmers may have a number of different motivations. Plural motivations are significant for family farmers who are motivated by productivism alongside maintaining the family farming way of life, keeping their place on the land, and developing the farm to pass on to their children. These motivations connect to the adoption of technologies that might increase output but also save time, make difficult or mundane activities easier and make running the farm more manageable for successors. Specific examples will be discussed in due course.

Consequently, the technological treadmill does not explain farmers' adoption of technologies to fulfil non-productivist motivations.

iii) Cochrane (1958) states that under the technological treadmill farmers who do not adopt technology are 'laggards' who will be forced to leave farming. Moreover, reflecting on previous criticism, the technological treadmill only explains farmers who are solely motivated by productivism and adopt technologies that lead to increased outputs. However, family farmers who tend to have additional motivations to productivism may decide not to adopt particular technologies at all. As discussed in literature that highlights the significance of family farmers (see Chapter 1 and 2), the lacking adoption of

technology (and specifically those that produce outputs) has not led to the demise of the family farm. Therefore, the technological treadmill does not explain the current importance and role of family farming within the UK agricultural sector (see also Ward, 1993). Moreover, it does not address the agency of these farmers, in relation to agricultural technologies.

iv) The continual adoption of technology by farmers looking to intensify their production to maintain their profits as part of the technological treadmill, is dependent on the constant availability of new and effective technologies.

Various factors impact the development of new technology including the level of public / private investment in agricultural research, the number of research institutes conducting research, and the number of researchers interested in positions at research organisations (Leaver, 2009; Buhler *et al.*, 2002). As a result, there is always a possibility that the availability of technologies may decrease, which would force the technological treadmill to slow or even stop. Production would cease and profits would decline. Indeed, Blaxter (1976 cited in Dexter, 1977, p.213) stated that decreasing production in the arable and livestock sectors in the 1970s was a result of 'the white heat of the technological revolution [...] cooling down'. Blaxter (1976 cited in Dexter, 1977, p.213) warned that 'if there is no new technological breakthrough, the present impetus of advance will have been almost expended by the end of the century'. More recently, concern has been expressed from within the All-Party Parliamentary Group on Agricultural Science and Technology that lack of investment in the research and development of agricultural technology means that UK farming will not be sufficiently equipped to cope with global pressures

connected to 'neo-productivism' (see Leaver, 2009). Consequently, the technological treadmill is not as stable, constant and fast-moving as suggested by Cochrane (1958) and other agricultural geographers for whom the concept has proved useful.

v) The movement of technology from centres of research and development to farms is not as simple as implied by the technological treadmill model of technology transfer (Buttel *et al.*, 1990). The introduction of the Agricultural Extension Service provides evidence that farmers required advice, guidance and support in attempting to apply technology from research institutes onto their farms (Buhler *et al.*, 2002). Although has now ceased, agricultural geographers have highlighted the role of 'replacements' such as representatives working for agricultural goods manufacturers, agronomists and media publications such as Farmers Weekly (see Tsouvalis *et al.*, 2000). Moreover, the government has introduced schemes that aim to provide support and guidance for farmers looking to change their farming / technological practice (Welsh Government, 2011n). The technological treadmill does not explain the often complex and intricate path of technologies from research and development to on-farm use.

vi). A review article published by Levins and Cochrane (1996, p.550) emphasises that the model of the technological treadmill was 'never empirically tested'.

vii) The agricultural and theoretical context of the technological treadmill has changed dramatically since the establishment of the model. Productivist policy that encouraged the industrialisation of agriculture began to change in the 1980s, as efforts were made to reduce over-production and environmental degradation. For example, in 1984 milk quotas were introduced to limit dairy production. Theoretical discussions and perspectives in agricultural geography have moved away from modelling the structure of the entire UK agricultural sector, to become more actor and cultural orientated. These historical and disciplinary changes mean that the technological treadmill has become out of date. As Ward (1993, p.350) states, the technological treadmill 'can be seen to be very much of its time'

These limitations are significant and add to the criticism of the connection made by some agricultural economists between the technological treadmill and the demise of the family farm during post-war productivism put forward in Chapter 2. As a result, there is the need to form a conceptual framework to think about technology as contributing to family farm survival rather than destruction. This is based on the principle that technology can be interpreted, introduced and adjusted in ways that differ from those intended by the manufacturer.

Some agricultural geographers have begun to draw on other areas of work such as that from Science and Technology Studies (STS) to consider objects and technology within a farming context. The work of STS recognises and explores the myriad ways in which objects or technologies are perceived, used, modified and rejected. For example, Mol (2002) argues that rather than

focusing on the intended function of objects or technologies, it is more appropriate to highlight and investigate the practices that involve them. This way of thinking means that 'reality multiplies' and the plural, varied and contingent practices that bring technologies to life are revealed (Mol, 2002, p.5). For example, an alarm clock can be used to rouse someone from sleep, remind them of a deadline, show the time or set off a bomb (Oudshoorn & Pinch, 2003). Furthermore, some practices may also be defined by resistance or refusal as technologies or objects are rejected and abandoned. In this case, it is possible to consider how objects and technologies 'come into being – and disappear' (Mol, 2002, p.4).

The ways in which a user engages with an object or piece of technology may be related to elements of their individual personality, knowledge, gender, life circumstances or cultural upbringing. For example, feminist scholars have considered the gendered qualities of technologies such as microwaves (Cockburn & Ormrod, 1993) and hair shavers (van Oost, 2003). Moreover, some social anthropologists have considered the impact of culture on the use of technology, such as Miller and Slater's (2001) exploration of uses of the Internet in Trinidad. Inspired by this work, some researchers have considered how the perception and use of agricultural technologies and objects is related to farmers' identity, experience, knowledge and gender. Saugeres' (2002, p.144) interviews and ethnographic observations with farming women who described frequent insinuations that they lack the expertise and physical strength to drive tractors emphasises that the relationship between objects/technology and gender emerges through 'everyday discourse and practice'. This is also evident in the work of Gray

(1998, p.341) who describes how hill sheep farmers in an area of the Scottish Borders constructed a wooden gate using 'rough and ready approximates and experience'. When asked whether they were going to use a tape measure to ensure accuracy, they laughed and said 'they were not skilled craftsmen [...] [but] *'practical farmers'*" (Gray, 1998, p.341; my emphasis). This connection between daily practice and knowledge that underlies the multiple uses of technology has been theorised as a 'knowledge-practice' (Morris & Holloway, 2008). Morris and Holloway (2008) describe the relationship between knowledge and practice as inseparable and co-constitutive (see Law & Mol, 2002). Research on the knowledge-practices that surround technologies in agricultural geography has identified different 'types' such as 'lay', 'scientific' and 'expert' and the interactions between them (see Morris & Holloway, 2009; Clark & Murdoch, 1997; Riley, 2008; Wynne, 1996; Tsouvalis et al., 2000).

Further investigation of the knowledge-practices that surround the plural uses of technologies will allow agricultural geographers to move beyond simplistic conceptions that technologies are used in set ways by particular groups of people to deliver pre-determined results. More specifically, it allows this PhD thesis to move beyond the theory of the technological treadmill which posits that technologies are only used to increase production on large corporate farms to result in greater profits. Rather, this new way of thinking recognises the uses of technologies on smaller family run farms for a variety of purposes. In turn, this allows a consideration of how their engagements with technology have contributed to their survival. The role of this culturally-inspired approach in theorising technological knowledge-practices has not yet been considered or evaluated within the context of family farm survival

3.3 The external connections of the family farm

The literature review discussed how agricultural economists in their commentaries on the era of post-war productivism argued that family farmers lacked connections with organisations within the broader agri-food system, such as banks, retailers and processors. This meant that family farmers struggled to afford finance to purchase technology. Without technology, they would not be able to increase their production to keep up with larger corporate farms and would eventually cease to survive. Some work attempted to move beyond this dualism of large and small farms by incorporating a third category of hobby farm, but this added limited insight into family farms, who were attributed with the same outcome by occupying 'the disappearing middle' (Symes, 1992; Munton & Marsden, 1991).

Later theoretical work from the perspective of modified political economy by Whatmore *et al.*, (1986a&b) acknowledged that family farms had actually continue to exist and attempted to theorise their external connections. They established the concept of subsumption, which is a theorisation of the varying degrees by which farm enterprises are controlled by the wider agri-food system (see Chapter 2). The concept of subsumption places family farms on the edge of viability and suggests that in order to survive they must either explore non-agricultural forms of income or expand their external connections to enable access to credit and technology. The concept of subsumption has been discussed as 'among the most significant in symbolising changes wrought in rural geography in the 1980s' (Short, 1996, p.51). Consequently, subsumption recognises the external connections of family farmers, but theorises them as controlling and exploitative. It has been cited in a significant

amount of work concerned with topics such as developing methods in agricultural geography and analysis of the rural environment (Short, 1996).

While the concept of subsumption has proved valuable to agricultural geography, it may be critiqued in three key ways:

1. The depiction of only four farm types offers a limited representation of the diversity present within the agricultural sector.
2. The concept of subsumption neglects the agency of farmers and, in particular, the influence of family farmers on their own destiny and survival (see Gray, 1998; Murdoch, 2000).
3. A lack of concern with the agency of farmers meant that the concept contributed to an institutionalised dualism within science which posited off-farm individuals and corporations as expert and scientific, and on-farm individuals (e.g. a farm family) as inexpert lay manual workers (Wynne, 1996; Clark & Murdoch, 1997; Tsouvalis *et al.*, 2000).

As a result of this criticism, modified political economy attempted to use the circuits of external individuals and organisations to look down to explore the interactions within family farms (e.g. Marsden *et al.*, 1989; Evans and Ilbery, 1992). For example, Evans and Ilbery (1992, p.85) use this theoretical framework to investigate how the implementation of on-farm diversification in the form of tourist accommodation is connected to interest by off-farm organisations, which adds 'another dimension to the penetration of agriculture

by private and public capitals'. Another example is the use of food chain analysis, which is concerned with investigating the processes of the food chain which include farming, processing, packaging, retail and consumption (Murdoch, 2000). Within these areas, analysis 'focus[es] upon actors, connections and spatial research'. While this work did consider the activities of farmers, the emphasis within political economy on the power and influence of external connections limited its potential to explore truly their perspectives and practices (Murdoch, 2000).

More recent work in agricultural geography has gone further to consider the range of connections between farmers and other entities within the rural landscape. For example, Murdoch (2000) discusses attempts to draw on Actor Network Theory (ANT) to consider the the agri-food system. This work explores the powerful connections between the social, natural and technological elements of the agri-food system. The social element of the agri-food network includes a range of individuals and institutions, such as farmers', livestock breeders, corporations and scientists. The natural element involves animals, crops and diseases such as BSE (Murdoch, 2000). Finally, the technological element may constitute technologies such as biotechnology, genetic modification or robotic milkers (Murdoch, 2000). The connections between these elements are created through processes such as negotiation, interpretation or modification (Murdoch, 2000). For example, Ilbery *et al.*'s (2012) description of a farmer reducing the application of a pesticide to once every two days rather than once every day, represents a modification of the technological element of the agri-food network or culture by the social. This example indicates that processes of modification are beginning to be

acknowledged, but the role in the survival of the family farm is not yet considered.

The appreciation of multiple, autonomous and knowledgeable actors that exist on and off farms means that the concept of the network is very useful for agricultural geographers. For example, Tsouvalis et al. (2000) draw on ANT to create their concept of a knowledge-culture, which refers to how individuals are connected to nature and technology through processes of 'sense-making' (Tsouvalis et al., 2000, p.912). They applied this concept to the introduction of precision-mapping technology to consider the similarities and differences between a yield map and farmers' knowledge of 'good' and 'bad' areas within a field (Tsouvalis *et al.*, 2000). Another example is Morris and Holloway's (2008, p.1711) investigation of 'the emergence of new techniques of genetic assessment and evaluation in livestock breeding', which reveals the networked nature of knowledge. They argue that this technology has led to the decreasing importance of knowledge based on 'the hands-on, practical experience of groups of breeders and breed societies' in favour of the knowledge of specialist scientists (Holloway & Morris, 2008, p.1711). Evans and Yarwood (2000) have also utilised ANT to explore rare farm livestock and the the role of the Rare Breeds Survival Trust (RBST) in networking their survival.

This research indicates the importance of post-political economy frameworks such as food chain analysis and ANT to analyses of contemporary agricultural change. However, there are four areas of criticism to be noted:

1. Food chain analysis is predominantly concerned with representing a vertical configuration of the agri-food system, which does not adequately reflect its extent and diversity. For example, it does not explain the processes of choice or decision-making that individuals undertake when selecting one entity over another within an element of the agri-food system (i.e. a farmer may choose to deliver his/her animals to one abattoir over another).
2. The attention given to the different elements of the network in investigations guided by ANT is often uneven (Murdoch, 2000). Explorations tend to favour those elements that hold the most amount of power and significance (Murdoch, 2000).
3. Applications of food chain analysis or ANT prioritise the observation of connections that are built through processes concerned with the transfer of economy, goods or equipment. Consequently, they neglect connections that are built through social or cultural exchanges.
4. Theoretical work utilising either food chain analysis or ANT has not been applied to the context of the family farm and its external connections.

This element of the conceptual framework is concerned with fulfilling the research potential that is highlighted in these areas of criticism. The study seeks to place the family farm at the centre of the identification and investigation of their external connections. Although there is potential to use this material to contribute directly the conceptual frameworks of, for example,

ANT or knowledge-cultures, the lack of research on external connections from the perspective of the family farm makes this untenable within the scope of this PhD. The key contribution to knowledge here is an investigation into *all* the connections that are emitted from the family farm including those which might enable them to socialise, gain knowledge about new forms of farming practice and technology, and receive finance for their farm goods. It will be possible for future research to expand and develop this material to make greater theoretical contributions.

This investigation adds a geographical dimension to this study as investigating and mapping the external connections of family farms will create insights into the wider rural environment. Individuals and institutions are usually tied to set physical locations and these external connections will weave through the landscape. This has been suggested by Murdoch (2000) who argues that the understanding of networks has implications for policy that seeks to develop the whole rural landscape and environment. This exploration will also reveal the spatial and scalar nature of the external connections of family farming. For example, it will consider the importance of the local farming community. It is also appropriate to consider and compare connections to look at the relationships between them. According to the configuration of the farm family, some connections may be more important than others. For example, the farm family may prefer to buy animal feed from a local supplier but be forced to use a larger national chain store for more specialised products. Connections may also be rejected or changed over time. For example, if a well-respected representative for an agricultural merchant retired, the farmer might choose another merchant. Exploring the

external connections present within family farming will therefore indicate how theoretical literature concerning the rural environment, networks, food chain analysis and knowledge-cultures may contribute to studies of this area of the agricultural sector.

Exploring the relationship between family farming and external connections within this study reflects a broader theoretical concern with drawing together the perspectives of modified political economy and culturally-inspired theory. However, unlike modified political economy which drew together these characteristics in order to use the external to *look down* at the internal, this study uses the internal to *look up* towards the external. This PhD study will investigate and argue that the practices, decisions and structures within these elements (internal dynamics, engagements with technology and external dynamics) are related by an embedded and engrained desire within family farming to survive through periods of agricultural change.

3.4 A longing to survive on the family farm

The literature review discussed the difficulty of analyses of post-war productivism to provide an explanation for the survival of the family farm. These analyses argued that an inability to engage with technology or external connections would lead to the demise of the family farm. Some agricultural geographers suggest that later phases of agriculture such as post-productivism and organic farming offer different activities for family farmers to improve their future prospects. This context has led to interest in 'survival strategies' for family farmers.

Meert *et al.* (2005, p.82) write that a survival strategy is 'developed by the farmers and his/her household to prevent or alleviate the situation of insufficient household income'. Survival strategies usually involve reducing farm work to a part-time basis, to allow time for other activities. The most significant examples of new activities include on-farm diversification (such as setting up tourist accommodation or direct selling via a farm shop) and undertaking off-farm employment (Gasson, 1986; Meert *et al.*, 2005). Some research has been conducted specifically on how family farmers have adopted survival strategies. For example, Meert *et al.* (2005, p.82) studied how 'diversification mechanisms are used on marginal farms [located in an area of Belgium] as survival strategies'. This work explores how family farmers select different forms of diversification according to their financial position and range of external connections. For example, financially secure farmers who wish to protect their future survival prospects have sufficient time, resources and social contacts to set up new enterprises (e.g. a farm shop) and establish a customer base (Meert *et al.*, 2005). In contrast, financially insecure farmers are more likely to make smaller changes such as selling milk from a table at the farm gate, which do not depend on lots of investment or new customers (Meert *et al.*, 2005). As a result, this research provides useful insights into how family farmers create survival strategies based on diversification activities that fit into their whole farm context. However, despite this contribution, work on family farmers and survival strategies may be critiqued in 2 ways:

1. Survival strategies depend on a conceptualisation of 'survival' as inherently economic. For example, Meert *et al.* (2005, p.82) write, 'in this interpretation, survival strategies have a clear economic dimension'. This does not account for farmers who think of survival in different terms, such as the preservation of a distinct way of life. Other earlier connotations of the term such as the acquisition of land or capital have been described as imprecise and uncritical (Gasson, 1986; Crow, 1989).

2. Although Meert *et al.*, (2005) explore range of survival strategies that involve a variety of activities, the term survival strategy implies a prescriptive, pre-meditated and fixed process. This does not adequately explore the creative, innovative and sometimes random activities of farmers. For example, Evans (2009) discusses how one farm decided to rent land on a part-time basis to a Parachuting Club as part of an adjustment strategy.

More recent work has re-considered the term survival strategy to incorporate broader understandings of farm adjustment and rural resilience (Chaplin *et al.*, 2004; Johnsen, 2004; Darnhofer *et al.*, 2010; Milestad & Darnhofer, 2003).

For example, Evans (2009) looks in detail at individual farms to first, identify the key elements of farm adjustment, second, investigate the integration of conservation and third, to establish how these might connect to form a strategy. This farm-focused approach allows for detailed insights into the decisions and actions that surround farm adjustment, and how these link into perceptions of survival. This work echoes the view of 'family farm survival as one of 'form' and not just 'existence' (Evans, 2009, p.228). To take this

further, survival is an emotive term that hints at ideas surrounding family history and lineage, home and way of life. As a result, inspired by work on the geography of emotion (Pile, 2009; Davidson & Millingan, 2007) family farm survival is also about feelings, emotions and sentiments.

This element of the conceptual framework will draw together the preceding three. It will consider how the relationships between internal dynamics, engagements with technology and external connections contribute to the survival of the family farm. To do this, it is particularly concerned with 2 inter-related key principles. First, the thesis understands survival not as a rigid 'strategy' but as a concept that is rooted in the everyday practices and motivations on the family farm. As a result, the term 'survival strategy' is omitted in favour of 'survival'. Second, survival itself is not perceived as a purely economic situation, but as a deeply embedded emotional longing.

Figure 4 presents a visual depiction of the conceptual framework. Figure 5 looks more closely at each element and the connections between them.

Figure 4: Diagram of the conceptual framework

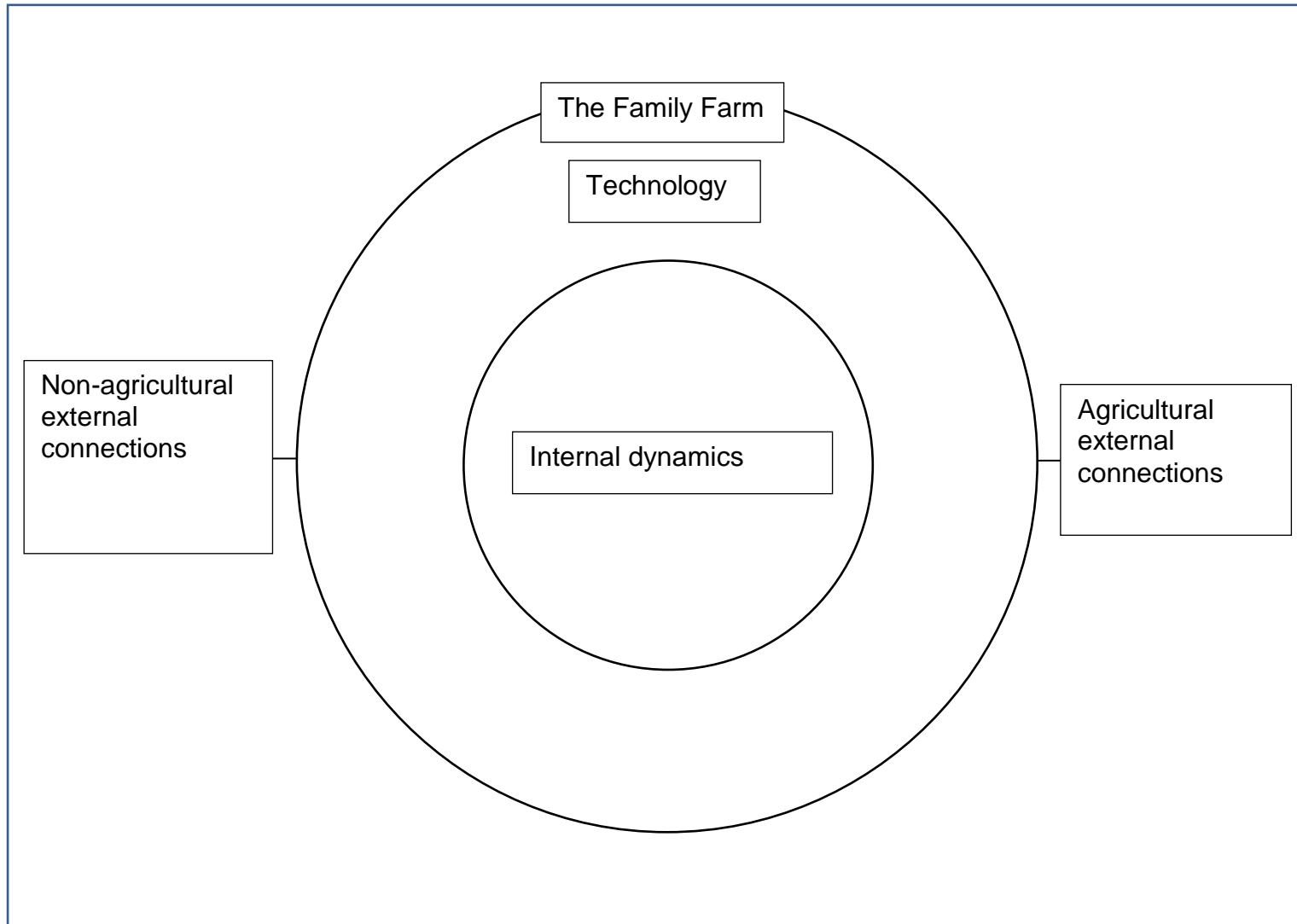
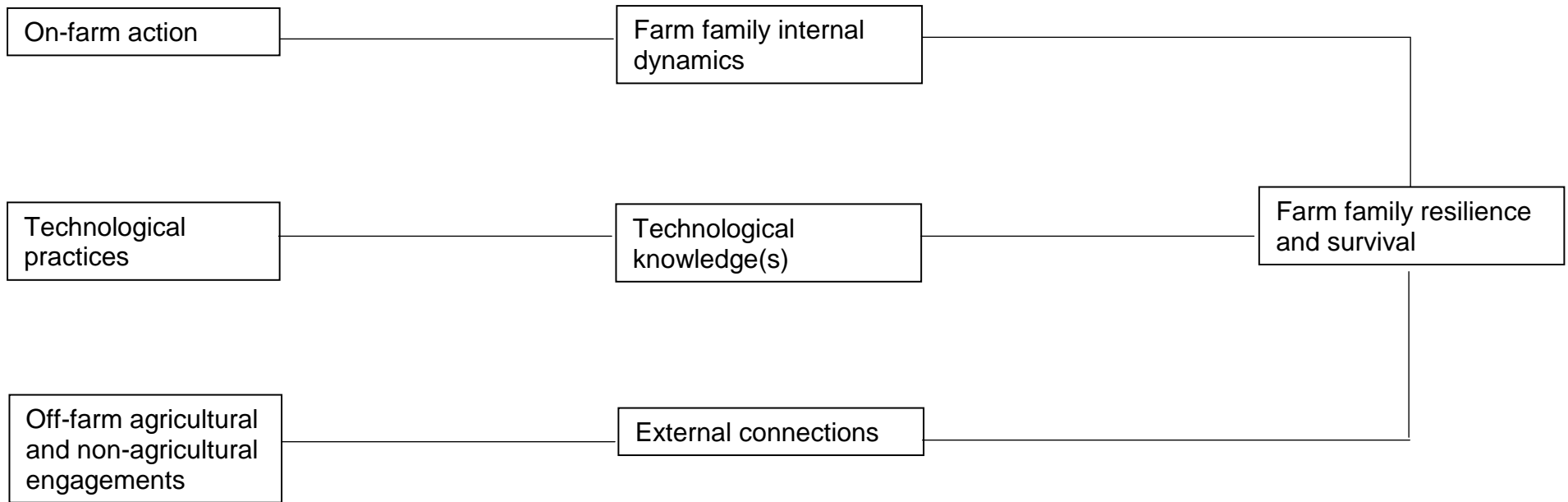


Figure 5: Diagram of the elements of the conceptual framework



CHAPTER 4: METHODOLOGY

The literature review and conceptual framework of this study have provided a structure by which to fulfil the aim of investigating the contemporary family farm and its survival throughout periods of major agricultural change. This structure is composed of three elements which relate to the survival of the family farm that emerged from the review of literature within agricultural geography. The first element is the internal dynamics of the family farm, the second is its interactions with technology and the third is its external connections. Understanding the ways in which these integrate and combine is key to exploring family farm survival. This is a new area of research for rural and agricultural geography. This chapter is concerned with *how* these objectives will be achieved, in order to fulfil the overall aim of the study.

The study takes a qualitative approach to investigating the contemporary family farm. This is justified by the framework devised for this study, which starts with the inner workings of the family farm before moving outwards. This framework is based on conceptual debates related to the cultural turn, which advocate methods that are concerned with revealing the social and cultural lives of individuals and groups (see Morris & Evans, 2004). Methods associated with the qualitative approach include interviewing, certain types of questionnaire (e.g. those that allow open-ended answers), completing a fieldwork diary and participant observation (Shurmer-Smith, 2002). In agricultural geography in recent years, partly due to the conceptual debates pertaining to the cultural turn, there has also been increasing interest in the qualitative method of ethnography. Ethnography is an approach traditionally associated with social anthropology and is centred on exploring

the knowledge and daily lives of participants, which can be revealed by researchers who undertake a subjective role. This subjective role is reflected in the writing-up of research material, which is undertaken in the first person. The approach incorporates a wide range of methods including participant observation, undertaking fieldwork to live and work alongside participants, the completion of a fieldwork diary and the collection of oral histories. As such, ethnography is a useful methodological approach for interests in agricultural geography concerned with, for example, knowledge(s), interpretations of texts and visual imagery, and agri-culture (see Morris & Evans, 2002; Hughes *et al.*, 2000). Despite this potential, ethnography has been rarely implemented within the sub-discipline.

The focus of this study on the everyday life, actions and underlying engrained motivations of farming means that the use of ethnography was particularly appropriate. Ethnography was implemented by placing the researcher within the context of primarily one family farm for an extended period of fieldwork of 6 months. This restriction to one family farm enabled the researcher to be immersed in daily life, discussions and practices. This allowed the research to produce material according to the study aims and objectives, and conceptual framework (cf. Pile, 1990, p.406). Moreover, it enabled her to explore the unexpected or surprising activities and embedded concerns that can only be revealed by being present on the family farm long enough to build up sufficient experience and trust. More focused follow-up methods (such as semi-formal interviewing and participant observation) allowed the researcher to explore how these events and practices constituted the internal form of the family farm, which fulfils the first objective of this study.

They also enabled her to identify, observe and participate in engagements with technology on the family farm, which satisfies the second objective.

A central limitation of the ethnographic approach is its restriction to relatively small study areas and numbers of participants. This means that it can lead to representations of individuals or groups in an isolated or reified way, which lacks appropriate contextualisation. Critiques of research conducted within Community Studies undertaken in the 1950s and 1960s have argued that ethnography contributed to images of bounded entities (Harper, 1987). The literature review and conceptual framework discussed the presence of external connections in agriculture and argued that their significance to the survival of family farming needed to be investigated. As such, this study will utilise a particular form of ethnography to capture these connections. Multi-sited ethnography involves conducting fieldwork in the primary study area, before exploring the ways in which its participants engage with individuals, locations and events outside of it. The study implemented this methodological approach as the researcher travelled with family members as they left the farm to visit friends, take animals to the abattoir, purchase livestock feed etc. These connections were often two-way as friends, workers and business representatives visited the family farm. Observation, tracking and recording allowed the researcher to compile a comprehensive representation of the external connections of the family farm, which fulfils the third conceptual dimension of this study.

The remainder of this chapter is concerned with the detailed process by which this methodological framework was implemented within this PhD study. The chapter is split into five sections. The first section details how the

researcher entered the field and includes discussion on the use of a gatekeeper and a pre-fieldwork study. Section 2 explains the application of ethnography on a family farm. The third section outlines the use of multi-sited ethnography. Section 4 explores the impact of positionality on the research. Finally, section 5 indicates the process of leaving fieldwork and analysis of the collected material.

4.1 Entry into the field

Preparing to begin a long period of ethnographic fieldwork is often considered an uncertain, nerve-wracking and difficult time for a researcher. For example, some have documented feelings of 'fieldwork nerves' or anxiety (e.g. Michalowski, 1996). In order to alleviate these experiences, others have spent a brief period of time in the field prior to the 'formal' phase of fieldwork in order to find out 'factual' or other contextual information and assess its relationship with their aims and objectives (e.g. Bacchiddu, 2004; Fielding, 2000).

However, it is usually the case, and particularly within geography, that these experiences and actions are either not documented within publications at all, or are marginalised in footnotes. Within this study, embracing and engaging with a 'distinct' phase of entry into the field as a key part of the research process had four key benefits. First, it allowed me to engage with and present the study to the agricultural community and locate farm families who might be willing to participate. Second, it offered a chance to increase my awareness of topical issues within the agricultural sector and to gain knowledge to take into the field, particularly of technologies such as genetic modification. Third, it was possible to 'test out' the ethnographic approach and associated methods,

which contributed to the development of the study. Fourth, it enabled a meeting with a gatekeeper who introduced me to the central family farm of the study. During this phase, three categories of events which constituted entry into the field emerged: i) events, shows and blogs, ii) pre-fieldwork study and iii) entry with a gatekeeper. This section will explore each of these categories in turn.

4.1.1 Events, Shows and Blogs

This sub-section is concerned with a series of events and activities that I attended and participated in. These involved a conference focused on the role of genetic modification in future agriculture, a county show and the establishment of an online blog on the website of a farming magazine.

i) A conference on the role of genetic modification in UK agriculture

In order to gain access to the most recent information on agricultural technology in order, I attended an open conference on genetic modification and its role in food security. This conference was particularly relevant as it was explicitly concerned with the introduction of genetically modified crops to farms. Consequently, this provided a source of specific information and knowledge on GM that that I could use as 'stimuli' within focused discussions undertaken on the family farm during fieldwork.

In February 1999, the polarised and vociferous debate on genetically modified foods reached a peak which was fuelled by interest within the media, policy, charitable organisations and public opinions (Parliamentary Office of Science and Technology, 2000; Herrick, 2005). More recently,

around 2009, the recognition that genetic modification could be a key tool in alleviating concerns surrounding food security as part of 'neo-productivism' has reinvigorated this debate. Consequently, as part of this study into family farming within a 'neo-productivist' context, it has been necessary to engage with the rhetoric of the debate. A key example of this engagement is attendance and contribution to a debate entitled '*GM crops and food security: curing the world's growing pains?*' which was held by *Talk Science* at the British Library, London, on the 21st January 2010. Ecologist Prof. Rosie Hails began the debate by arguing for the need for an informed and 'holistic approach' to investigating the relationship between GM crops and biodiversity (Perkins, 2010). This provided the foundation for an 'open floor' discussion which included audience members employed in policy-making, academia, journalism and organisations such as the British Ecological Society. Topics of particular significance to this study included the relationship between GM and differing geographical contexts (e.g. are GM crops better suited to lowland areas?), the 'gap' between scientific research on GM and on-farm application, and the 'loss' of economic benefits for farmers who rely on family labour because GM is more likely to save time than increasing production or income directly (Perkins, 2010). However, these topics that clearly relate to farmers' prospective experience of GM became quite poignant considering the lack of any members from the farming community in the audience. This also added further insights into discussions on technology associated with neo-productivism (see Chapter 2) and emphasised the significance of investigating the contemporary family farm.

ii) The Three Counties Show

Agricultural shows are events made up of a range of exhibits, competitions and displays associated with agriculture and rural life. Farm families are key contributors to these shows through competing for prizes with their products (e.g. livestock, poultry, preserves, grain or wool), country crafts (e.g. cookery, flower arranging or gardening), skills such as sheep shearing, handling or stock-judging and displays. These shows attract a significant number of visitors from the general public who appreciate seeing farm animals 'up close', purchasing farm-produced goods and watching the agricultural displays (e.g. sheepdog trials or harness racing). As a result, agricultural shows have been described as a point of 'convergence of agricultural and non-agricultural functions, entities and people' (Holloway, 2004, p.320). Moreover, they are central to the communication and presentation of agriculture by those involved in farming, to a non-farming audience (Holloway, 2004). Consequently, in order to experience up-to-date agricultural practice and to meet family farmers who might be interested in contributing to the study, I signed up as a student volunteer at the Three Counties Show, Malvern, Worcestershire which was held between 18th-20th June 2010. Following a discussion of my study and research interests with the organisers of the show, a period of three days of volunteering was split between the 'business' and 'competition' areas of the show. Specific activities ranged from helping to provide hospitality and refreshments at events hosted by rural enterprises and businesses, processing judges' reports, sorting out rosettes and prizes for competition winners, and running errands across the showground. Alongside these

activities, I was able to meet and discuss elements of the show with staff, the National Farmers Union (NFU), farmers competing at the show, a member of the organisation team of the Royal Melbourne Show (Australia), and well-known media personality and farmer Adam Henson. These included the genetic diversity of livestock within the UK, agriculture within a global context, and the importance of farming to feeding a growing world population. In terms of preparing for fieldwork, these insights and related discussions gave key insights into the businesses and enterprises within the agri-food system, the importance of agricultural shows for family farmers, and anticipations of future change for the agricultural sector.

iii) Blogging

Online blogging is emerging as an important tool and practice for academics and students (Kirkup, 2010). Blogs may be aimed at promoting research or a discipline (e.g. Savage Minds, 2010; Give Geography its Place, nd.), used as 'spaces' for reflection and developing ideas (e.g. Saga, 2009), to communicate and discuss issues with peers (e.g. Impolite Geography, nd.), and as a way of reaching out to research participants (Javier, nd.). Although it is necessary to address issues such as releasing material that could jeopardise publication opportunities or be controversial or commercially sensitive, in this study it was appropriate to explore the potential opportunity to communicate with and seek participants from the farming community using a blog. Consequently, with the kind permission of Farmers Weekly (being connected with this well-known farming publication meant that the blog would reach a specifically farming based audience), I set up a blog on the site

Farmers Weekly Interactive (nd.). I introduced myself as a PhD student with great enthusiasm for learning about farming and undertaking a study on the role and significance of agricultural technologies on family farms within the UK. I also added some brief information on non-academic interests and hobbies, which added some familiarity and personality for prospective readers. Subsequent blog material ranged from outlining ideas and experiences to requesting dialogue, discussion and participation in the study. For example, I encouraged farmers to read an open-published opinion article written about my engagement with the *Talk Science* debate on GM crops (Perkins, 2010) and experience of volunteering at the Three Counties Show. In addition, I asked for feedback on the plan for fieldwork research and communicated the location and duration of activities associated with entry into the field (such as volunteering for three days at the Three Counties Show) with the hope that may be an opportunity to meet willing farmers in person. Unfortunately, posting on the blog did not lead to any discussion (either online or in person) with farmers or the meeting of suitable participants for the study. Some researchers in agricultural geography (e.g. Bennett, 2005b; Price, 2006) have written about the significance of personal contacts in order to conduct research with farmers, so the lack of offline contact might explain the lack of success of the blog. However, as it is not possible to know how many readers or 'hits' the blog receives, it is unclear whether the information contained within it was actually disseminated effectively amongst the farming community. This process of writing this material also helped me to present myself and the study effectively to prospective participants who were met through other opportunities.

4.1.2 Pre-fieldwork study

Pre-fieldwork or pilot study prior to larger-scale fieldwork or data collection is considered a useful way to improve the quality of study by questioning whether chosen methods are the most appropriate, ensuring access to participants and to assessing the suitability of the study area (Kitchin & Tate, 2000). For example, literature on methods in geography focuses on how questionnaires or interviews may be trialled to check that questions flow, are easy to understand and do not cause offence (e.g. Robinson, 1998; Cloke *et al.*, 2004; Hoggart *et al.*, 2002; Clifford & Valentine, 2003). However, undertaking pre-fieldwork study is also effective for preparing for in-depth ethnographic study where it may be necessary to explore a study area and its inhabitants, and question the relevance of study aims and objectives. For example, Bacchiddu (2004, p.2) describes that undertaking a 'short preliminary field trip' prior to her long-term anthropological fieldwork helped her to assess the appropriateness of the location and potential participants, experience and prepare for the challenges of fieldwork, and finalise her research proposal. For this study, pre-fieldwork study was considered a useful way to engage with farm families, the role of technologies on their farms and gain knowledge on genetic modification. This served to refine the study aims and objectives, explore and clarify the methodological approach, and meet potential participants. Pre-fieldwork study was made up of a visit to a family farm in South Shropshire, England, and a seven day stay studying within Perth and Kinross, Scotland.

The visit to a family farm took place during the autumn of 2010 at a dairy farm in South Shropshire, England, UK. A husband and wife team along

with several employed members of staff, milk a mixed dairy herd (Holstein Freisians, Jersey and Ayrshire cows), produce feed crops such as maize and peas, raise dairy bulls for beef, and are voluntary members of the (now closed) Countryside Stewardship Scheme. In 2008, an automatic or robotic milking system was introduced. Becoming aware of the farm whilst conducting an online search for family farmers' experiences of technology, I initially made contact via email to enquire about the possibility of a farm visit and an opportunity to discuss the automatic milking system. Having kindly accepted my request, I visited the farm where I was given a guided tour of the farm layout, a detailed description of how the automatic milking system works and the opportunity to take photographs. Following this, I was invited back to the farmhouse where we had a cup of tea and discussed a range of issues. These included the positive impact technology has had on the farm, the difficulty in verifying and sourcing non-GM feed which has meant removing the 'GM-free' label on the milk cartons, and the unfair reputation farmers have for conservation and animal welfare. This visit proved to be an excellent form of preparation for fieldwork as it enabled me to engage with the relationship between technology and family farming, understand automatic milking and think about its role within future agricultural change. It also made me aware of the problems surrounding the GM animal feed, and consider the challenges currently facing farmers. Achieving these insights through experience and informal discussion also stimulated methodological thoughts surrounding the potential effectiveness of participant observation, semi-formal interviewing and focused discussion within an ethnographic approach.

During the summer of 2010, I travelled to the small town of Milnarthort, which is located just outside Kinross within Perthshire, Scotland, UK to conduct some pre-fieldwork preparation. This area was of particular interest due to a tradition of family farming, the work of the Scottish Crop Research Institute (SCRI)² in developing GM technology, and the potential for investigating the role of a devolved government on future ('neo-productivist') agricultural policy. As a result, during the stay I hoped to investigate and learn more about these areas of interest alongside 'testing' the effectiveness of methods such as participant observation, focused discussion and maintaining a fieldwork diary. This interaction might have also introduced me to potential participants for later fieldwork. The whole stay proved to be extremely useful in preparing me for the objectives and demands of fieldwork, but two experiences stand out as being particularly significant. First, I spent a day at SCRI learning about the 'science' behind genetic modification and how the technology is being implemented in research on plant disease. There was also the opportunity to discuss and experience the connections between this research into genetic modification and UK farming practice (see Perkins, 2012). In terms of preparing for fieldwork, this knowledge and experience provided a substantial amount of material for use as stimuli within focused discussions on genetic modification with farm families. Second, whilst visiting the Kinross Show, I met a farmers' wife and her son with whom I discussed automatic or robotic milking systems. A number of issues arose, including the problems surrounding the design of early systems (e.g. the lasers were often

2 Since the pre-fieldwork trip, SCRI has now undergone a merger to become the James Hutton Institute.

unable to 'locate' the cows' teats), the change in daily routine as a result of the technology (e.g. the abandonment of a twice-daily milking), and the udder formations which are easily located by the lasers but are not necessarily favoured by the show judges of pedigree breeds (Perkins, 2012; see also Holloway *et al.*, 2011). This discussion offered some key insights into the varied experiences or perceptions farmers have of automatic milking systems, and provides a useful comparison to the visit to the family farm in Shropshire. In addition, the rich perspectives collected through this discussion which was purely focused on automatic / robotic milkers highlighted the merit and future potential of using focused discussions as a method during fieldwork.

4.1.3 Entry with a gatekeeper

Gatekeepers are usually individuals who 'provide – directly or indirectly – access to key resources needed to do research, be those resources logistical, human, institutional or informational' (Campbell *et al.*, 2006, p.98; see also Johnston, 1994). They might act to facilitate or block access to the field, give or refuse consent for research, introduce researchers to participants, protect participants and research settings, and handle letters of introduction or descriptions of research (Wanat, 2008; Kawulich, 2011; Kitchen & Tate, 2000). As a result, the relationship between researchers and gatekeepers is often complex and contingent over the duration of the research process (Campbell *et al.*, 2006, p.98). Within human geography, interactions with gatekeepers are considered necessary and advantageous to field research (Campbell *et al.*, 2006). Gatekeepers and their roles may evolve through personal connections and friendships (Bennett, 2005b; Price, 2004, 2006)

Within this study, an ethnographic approach demanded long-term and in-depth fieldwork which involved living with and working alongside participants. As a result of this extended, deep and potentially personal engagement, it was considered most appropriate to use a gatekeeper. I envisaged that introducing myself and the study to a gatekeeper would enable introduction to a suitable family farm, prepare them for the experience of fieldwork and the constant presence of a student researcher, and encourage familiarity and openness early on in the research process. This would also provide an opportunity to discuss issues such as the right to withdraw and the preservation of confidentiality and anonymity, which would begin the process of ensuring appropriate ethical conduct and practice issues throughout the study. As a result, various individuals within organisations were contacted, such as the NFU and Scottish Natural Heritage, via email, telephone and in person. The subsequent discussions held with these individuals were very helpful in terms of receiving guidance on contacting family farms, how the research might progress during fieldwork, and highlighting how my background or ability might be useful. For example, it was suggested that I might use my experience of public speaking to present my research to Young Farmers Club, which could generate interest and lead to the formation of contacts with participants. However, while helpful, none of these discussions led to introduction to specific family farms that could act as participants for the study.

A family friend emerged as the key gatekeeper for this study. After chatting about my studies, Rachel³ offered to introduce me to some members of her family currently farming in Ceredigion, west Wales. We arranged to meet one morning at her home, and we discussed in detail the nature of my research and what fieldwork would entail. She was very interested and encouraging, and said that she would phone two families who she felt would be most appropriate. After this, I would post a letter which would introduce myself and would provide more details about the study. Rachel suggested that the letter should include information about the PhD, what I would be particularly interested in seeing or discussing during fieldwork, and that I would like to stay with a farm family for the whole duration. It was recommended that, rather than exchanging money, I would state in the letter that I would exchange working on the farm for 'bed and board'. Although it is likely that Rachel suggested this because it would make things easier and less awkward, this arrangement also avoids the ethical issue of exchanging money for research facilities or material. I was a little anxious about this, as I did not feel my lack of experience and skill at farming would 'cover' the facilities that could be offered. However, Rachel put my mind at ease, saying that it would be much easier to deal with these issues when I met the families in person, I would learn fast and contribute in ways that I would not expect, and that she would discuss these issues on the phone with them. In addition, Rachel also suggested that I describe my time on the farm as a type of 'advanced work experience' as she felt that 'fieldwork for a PhD' could

3 Following guidelines on the preservation of anonymity and confidentiality (see ESRC, 2010), pseudonyms have been used for all individuals.

cause unnecessary unease for people unfamiliar with academia or university study. Again, she said that she would talk about and clarify these details over the phone. In addition, I included a few sentences to confirm that I would adhere to ethical guidelines concerning the preservation of anonymity and confidentiality. I also wrote a little about myself, my hobbies, commitment to this study and relationship with Rachel. This added some personality and familiarity to the letter. A few days after posting the letter, Rachel phoned to say that one of the families had contacted her to say that they would be happy to participate in the study as detailed in the letter and the phone call. Later on that evening, the farm family rang me directly. We were both very excited to discuss the study, their ideas for what I could do during fieldwork and arranged to meet personally in a fortnight. As a result, I drove to the farm one evening and spent a few hours meeting the farm family, having a tour of the farm and discussing when would be the best time for me to return for fieldwork. This family farm then became 'Fferm Ysgawen'³ within the study.

4.2 Ethnography

Ethnography has been at the centre of debates that attempt to define, give meaning and outline the practical or methodological applications of this complex term and concept (see Hughes *et al.*, 2000; Herbert, 2000; Gray, 1998). According to Hughes *et al.* (2000, p.3), ethnography is an 'approach which centres on a very particular epistemological standpoint'. This standpoint is concerned with recognising and including the knowledge, feelings and emotions of the researcher within the methodological process (Herbert, 2000). For example, Gray (1998, p.344) describes how he 'lived and worked with

farmers and shepherds for nearly two years during which [he] became a participant in their intersubjective lifeworlds'. There is also a commitment to an awareness of heterogeneity and diversity, and to revealing the multiple and marginalised voices within society (Herbert, 2000). To illustrate this, Gray (1996) discusses how his ethnography of hill sheep farmers was justified by a critique of work which represented them as subsumed by the processes of capitalism and EU policy. Gray (1996) argued that the cultural and practical experiences of farmers themselves needed to be recognised and illuminated. A variety of methods and research techniques may be explored and utilised within an ethnographic approach (Shurmer-Smith, 2000; Clifford *et al.*, 2010; Herbert, 2000). Examples include the collection of oral histories, analysis of textual and archival material, participant observation and focus groups.

Ethnography has a long tradition within the discipline of social anthropology, with a wealth of studies being conducted in many regions around the world (Eriksen, 2001). In recent years, a commitment to exploring the increasing fluidity and diversity within culture(s), especially within the UK, and theoretical concern with the subjectivity of knowledge has led to other disciplines and sub-disciplines adopting ethnographic approaches and methods (Herbert, 2000). For example, Hughes *et al.* (2000, p.1) write that there has been 'an explosion of interest in ethnographic methods in rural geography'. Within agricultural geography, work on farmers' interactions with issues such as conservation and farming policy has begun to draw on ethnographic methods such as participant observation and in-depth repeat interviewing (see McEachern, 1992; Gray, 1996, 1998; Price & Evans, 2001; Pile, 1990; Riley, 2010; Riley & Harvey, 2007; Lee, 2012). To illustrate,

Fielding (2000, p.66) used participant observation and interviewing within an ethnographic approach to explore 'the complex (re)construction and representation of a 'marginal cultural identity' in Swaledale, North Yorkshire. However, despite this work, the sub-discipline remains reliant on structured questionnaires and surveys (Morris & Evans, 2004). This leads Morris and Evans (2004, p. 107) to argue that

'there is room for a far greater diversity of ethnographies, focus group work, and participation activities to name but a few which can be used with the full range of individuals (or sub-cultures) associated with farming activities'.

4.2.1 Operationalising Ethnography

The concern of this PhD study with the daily practices, motivations and aspirations, and technological knowledge-practices of family farmers demanded an ethnographic approach. Similar to Gray (1998, p.344), implementing ethnography by living and working on a family farm for an extended period of time (6 months) enabled me to become part of their 'lifeworld'. This was made up of practices and experiences such as feeding cows or checking sheep, debates amongst family members, learning to use pieces of technology and machinery (e.g. driving a quad bike or filling a slurry tank), helping veterinary practitioners test livestock and cooking the family meal. As time progressed, I began to lose the identity of 'guest' and became 'the student', which meant greater responsibilities (e.g. collecting food from the supermarket, checking the sheep each day and helping the children with

their homework) and immersion within the family farm way of life. It also led to the experience of unusual or unexpected practices, decisions and events. As part of this ethnography, more focused methods were used to draw out material on topics such as genetic modification, succession and the decision to deliver animals to a particular abattoir. These were 4.2.1 the completion of a fieldwork diary, 4.2.2 participant observation and 4.2.3 semi-formal interviewing, in-the-field and focused discussions. These methods will now be explained.

4.2.1 Fieldwork Diary

Completing a fieldwork diary or notebook involves writing down and recording material as it emerges in the fieldwork context. Material might include descriptions of key events, observation of the daily activities carried out by participants, or notes outlining the researcher's participation in these activities (Crang & Cook, 2007). A field diary or notebook also provides a space for the researcher to write personal reflections on the experience of undertaking fieldwork, such as feeling lonely, frustrated or a sense of accomplishment (Crang & Cook, 2007). Maintaining a diary or notebook is a continual process of 'sense-making' which involves recording, reflecting and collating detailed pieces of information from the field (Cloke *et al.*, 2004, p.197). Within the field, diaries or notebooks are a useful way to pause and 'take stock' of the research completed, re-emphasise the research focus and objectives, and consider future directions for fieldwork. Field notes and diaries are also an important way of recording material collected through other methods such as ethnographic experience and participant observation. The form of a fieldwork

diary or notebook varies according to individual researchers, the nature of their study and fieldwork, and the depth of engagement with the fieldwork context. However, it is common that diaries or notebooks are completed in four 'stages' (Cloke *et al.*, 2004). For example, the first stage might involve quickly jotting very brief notes in the field. The second stage would involve expanding and reflecting on these notes to create fuller descriptions or narratives away from the field context, perhaps during breaks or at night. If appropriate, a third stage might involve re-visiting these notes within the field, to check or discuss further issues raised with participants. Finally and fourth, this material may then be interpreted and polished to become excerpts within a publication or thesis. It is sometimes a challenge for researchers to know what to write, how to structure their notebook or diary and which pieces of information will be the most relevant and important for the study (Shurmer-Smith, 2002). General areas of interest for notes in a diary or notebook may be ascertained from the aims and objectives, and conceptual framework of the study. For example, a researcher with the research aim of looking at the way in which food is promoted and sold at a farmers' market may wish to begin by participating by purchasing some goods and writing about the experience in their diary. At the same time, the researcher must be aware of and take time to record illustrative or additional information.

Within this study, a fieldwork notebook was used to record and reflect on key events in fieldwork, participatory engagements and the experience of conducting fieldwork. I used two notebooks – one which fitted in my coat pocket and could be taken everywhere to jot quick notes and details, and a second which allowed space to elaborate these details into narratives. The

first notebook was primarily used to record material collected through participant observation. The second notebook was completed away where and when I had time and a quiet space to write more extensively. I was often able to use the kitchen table in the farmhouse, but also wrote in my car and at night. The notebook was structured into three categories that were based on the conceptual framework of the study. The first category was concerned with describing the seasonal and day-to-day events that took place at the family farm. This included writing about the experience of participating by working alongside members of the local community to complete tasks such as sheep shearing and baling. I also described feeling increasingly embedded within the family farm as I was asked to help with daily tasks, jobs and errands. The second category was concerned with the use of technology on the family farm, so I wrote details about how particular technologies were used and how significant they were in preparation for more detailed semi-structuring interviewing and focused discussions. As I was encouraged to use some of these technologies myself, I also wrote down brief instructions for their use, how I felt about the responsibility of using the technology and how much easier it made tasks. For example, I was able to compare walking around the farm with using a quad bike to feed the sheep. The third category was concerned with describing experiences at locations outside of the family farm. For example, I wrote here about the experience of learning how to milk dairy cows with another family and the relationship between the two farms. These three sections were used to reflect on how the research was progressing and what was still required to be completed. For example, at one point I questioned whether I had enough material on the use of technology on the

family farm. As a result, I was able to discuss this with the farm family and uncovered helpful material on why certain technologies were not used and how on-farm investment in technology (and buildings etc.) was decided. The notebook was also a place where I could 'let off steam' when feeling a little lonely and recognise the achievements of fieldwork.

4.2.2 Participant Observation

Participant observation refers to the immersion of the researcher as deeply as possible amongst people within the field context (Eriksen, 2001; Crang & Cook, 2007; Dowler, 2001). It involves participating in the everyday activities, tasks and routines carried out by individuals. This results in the formation of rapport and relationships which gradually allows the researcher to understand everyday life, practices and world-views from the perspective of participants (Bennett, 2002). Participant observation also implies interpreting and recording observations from the field commonly in photographs, film or fieldwork diaries. Consequently, participant observation involves maintaining a 'balance' between participation and observation to produce inter-subjective knowledge between the researcher and his / her participants (Bennett, 2002; Crang & Cook, 2007). This emphasis on immersion and inter-subjectivity means that participant observation is usually extremely in-depth, time-intensive (it is common for researchers to spend a year and return for further study), and affects the researcher on a personal level (Bennett, 2002). The origins of participant observation lie in social anthropology, which has a long-standing concern with investigating and theorising the heterogeneity of human life and existence through participant observation (Eriksen, 2001). However,

participant observation has proven to be useful for human, rural and agricultural geographers exploring a wide range of issues (Bennett, 2002). For example, Kneafsey (2000, p.52) found participant observation to be the most appropriate way for her comparatively to 'investigate issues of cultural identity and sense of place' in County Mayo, Ireland and Brittany, France. Living and conducting discussions with local people alongside becoming involved with local concerns (such as a language movement in Brittany) enabled Kneafsey (2000, p.52) to gain insights into issues which often led to 'contradictory and ambiguous responses' when investigated quantitatively. This indicates the significance of qualitative approaches like ethnography and the method of participant observation.

Having discussed the significance of participant observation within agricultural geography, this study utilised it as an important method to see and experience the practices of the family farm. Within the ethnographic approach, I used participant observation to engage with a variety of farm tasks such as weighing lambs ready for slaughter, preparing and packing meat, and helping with baling. This contributed to insights on the dynamics of the family farm. Other participatory observations involved using, repairing and modifying pieces of technology and machinery. I was able to accompany the family when they visited external businesses such as an abattoir and agricultural store. As such, participant observation led to the collection of specific material that related to the aims and objectives of the study.

4.2.3 Semi-formal Interviews, 'In-the-field' and Focused Discussions.

Interviews and discussions vary greatly in format and style according to the research study, nature of participants and the context of the interview (see Robinson, 1998). Within the ethnographic approach this study utilises, three forms of interview and discussion are particularly important: semi-formal, in-the-field and focused.

i) Semi-formal interviews

Semi-formal interviews commonly consist of a dialogue or narrative between the researcher and a participant centred on a series of questions or topics (Clifford & Valentine, 2003; Bennett, 2002). This fosters an environment of inter-subjectivity where both the researcher and the participant exchange questions and responses (Bennett, 2000). This means that interviews are usually in-depth, fluid, conversational and personal (Bennett, 2000 and 2002; Cloke *et al.*, 2004). Semi-formal interviews are particularly appropriate for research that considers the experiences or 'voices' of individuals, looks at potentially sensitive topics or abstract concepts, and acknowledges the subjective engagement of the researcher (Bennett, 2002; Cloke *et al.*, 2004). For example, within agricultural geography, Bennett (2005a) used semi-formal interviewing to gain deep insights into the work, routines, experiences and perspectives of farm women (see also Pile, 1989).

Within the current study, semi-formal interviewing was used at the beginning of fieldwork to provide a base of information prior to deeper engagement through further 'in-the-field' interviews and focused discussions. For example, semi-formal interviewing provided detailed information on the

animals on the farm, which provided a foundation for me to become involved in participating and observing their husbandry. Following the aims of the study and the conceptual framework, each interview was split into four thematic sections. The first section was concerned with gaining general information on the family farm. It included the farm characteristics (e.g. acreage of land, sector), family members and their roles, and motivations for family farming (i.e. maintaining a good way of life or making money). The second section explored current uses of technology. Section three explored the factors behind the use of particular technologies. Finally, the fourth section questioned anticipations or predictions for the future of the family farm and the whole UK agricultural sector.

ii) In-the-field discussions

Recent methodological developments have begun to highlight the importance of place and context to research methods (Crang & Cook, 2007). As a result, agricultural geographers using semi-formal interviewing are beginning to consider and engage with contexts such as the farm, farmhouse and farmland (e.g. Bennett, 2005b). For example, Riley (2010) collected oral histories focused on changing agricultural practices by conducting semi-formal interviews with members of farm families in their farmhouses, whilst walking around fields and carrying out tasks such as feeding animals (see also Riley & Harvey, 2007). This 'placing' of semi-formal interviews within the context of the farm family has three key advantages. First, it enables the researcher to engage with additional information, individuals and experiences which might be related to the semi-formal interview. For example, Riley (2010) found that

while he was interviewing a farmer in the farmhouse, his wife's presence and offering of points of clarification (e.g. the dates of specific events) meant that she 'was essential to it [the interview]' (Riley, 2010, p.653). Second, the researcher or the participant may 'tap into' elements of the location of the semi-formal interview, which may enhance the research engagement. For example, Riley (2010) describes that helping to feed cows whilst conducting a semi-formal interview led to a further discussion about increasingly automated practice, decreased time spent on labour and the introduction of different cow breeds since the 1970s. Third, conducting semi-formal interviews within the context of a farmers' home, land or day-to-day activities helps to provide a relaxed, familiar and convenient experience.

Following this literature, all the semi-formal interviews and discussions undertaken within this study were conducted 'in-the-field'. Most took place whilst seated at the kitchen table within the farmhouse and would always be accompanied by a cup of tea. Others occurred whilst walking around the farm as part of a farm tour or walk. We would often have discussions whilst sat on the quad bike, having taken a trip to check on or feed animals. Reflecting Riley's (2010) observations, interviews and discussions 'in-the-field' often contained additional information and led to other experiences that related to observations from the landscape context. For example, after noticing an ewe suffering with mastitis (inflammation of the udder) from the quad bike, we had a discussion on the role of farmers in the provision of animal veterinary care, and I was subsequently taught how to inject and treat her.

iii) Focused discussions

Discussions centred on forms of stimuli or foci rather than questions or themes as these were seen as a useful way to instigate responses on abstract concepts, topical issues or events, and a wide range of media (e.g. news reports or sound clips). Some studies in geography have begun to unpack this potential to use forms of stimuli such as photographs to discuss concepts such as family relationships, home and senses of belonging (Latham, 2003). Moreover, it has also been utilised by some agricultural geographers. For example, Riley (2010) explores the importance of photographs and paperwork (e.g. receipts) to discuss farm change. Nevertheless, 'focused discussions' have been applied most significantly within social anthropology. For example, Spindler (2008, p.133) led discussions based on hand-drawn depictions of 'traditional activities' such as dancing, cattle handling and driving a car with members of the Blood Indians of Alberta, Canada. Responses to the drawings reflected shared norms and principles. For example, a drawing of a piece of machinery left outside elicited responses such as "That's somebody's machinery lying out where it will rust. When he wants to use it there will be problems" (Spindler, 2008, p.134). These discussions contributed to Spindler's (2008) classification of 'major categories of perception' and a consideration of the 'relationship between perceptions and the utilization of psychological responses'. Within agricultural geography, the current representation of farming in popular culture through newspapers, television and radio programmes offers significant scope to appropriate material for focused discussions (for a discussion of farming within popular culture, see Morris & Evans, 2004). Building on this potential, in

this study, focused discussions were carried out 'in-the-field' and used in two key ways. First, farming-related stories or topics covered in the media or policy were used as a focus for discussion. Sometimes I introduced these topics, but at other times participants did. For example, following a discussion on the introduction of new technologies into farming, I was asked if I could find out about the proposed introduction of electronic tagging for sheep. After finding out some information (such as that available from Defra, 2011b) and presenting it to the farmer, we had a very informative focused discussion about the potential problems for family farmers who would be expected to pay for the tags, the likely loss of tags in the field, and the complicated regulations. Second, I produced a 'breakdown' of the key principles and aspects of 'neo-productivism' for use as a stimuli or focii in focused discussions on this form of agricultural change.

4.3 Multi-sited ethnography

Multi-sited ethnography is about moving beyond the central location of ethnographic fieldwork to engage with the flows and trajectories emitted from it, and other locations to which it is connected. It encourages researchers to follow, track and investigate these relationships and connections in order to contextualise the ethnography of a particular location. Consequently, multi-sited ethnography aims to maintain a balance between exploring phenomena such as embedded practices and forms of identity construction which may be associated with 'traditional' ethnography, and exploring the structures and processes that provide a context for these phenomena (Marcus, 2000). In order to do this in practice, the researcher begins by situating and embedding

him / her self within a central field site, which becomes a point of reference. According to the principles and methods of ethnography, the researcher employs methods such as participant observation and semi-formal interviewing at this site, as previously described, which establishes a foundation of research material. Progressing to move beyond this central field site, the researcher follows and explores various other connections, trajectories and field sites. Investigation is framed around a re-engagement with ethnographic materials. So, for example, the researcher might conduct a second set of semi-focused interviews at a second field site, which is related to the central site. It is important to not only acknowledge, but to engage actively with the relationship between the two field sites. Marcus (2000, p.19) suggests that material from the central field site should be used to 'absorb, critique and extend' that from others.

Multi-sited ethnography has its origins in a growing awareness of the necessity to understand increasingly complex and intricate social and cultural spaces. Transformative processes such as globalisation have not only dramatically changed the lived experience of social space and landscape, but also how researchers might engage with it. Researchers are urged to move beyond conducting ethnography in single field sites to engage with the flows, scales and spatial complexities characteristic of these processes. For example, in order to engage with activist movements against corporate globalisation, Juris (2010) employed a type of multi-sited ethnography to engage with activist movements against corporate globalisation. This involved remaining 'grounded' at the primary field site of Barcelona, Spain, whilst 'travelling with activists to various protests and events' (Juris, 2010, p.18).

Marcus (2000) writes that multi-sited ethnography may be effectively used to consider how social and structural contexts are produced from local knowledge held within different field sites. Consequently, this approach is particularly appropriate for investigating the external connections of a family farm. This constitutes the first application of multi-sited ethnography within agricultural geography. Within the period of fieldwork, multi-sited ethnography was implemented by following the farm family as they visited different individuals and organisations. This involved going to the shops to buy provisions for the farm, visiting friends and other farmers, and delivering livestock to the local abattoir for slaughter.

4.4 Positionality

Section 4.2 discussed the role of the subjective researcher within qualitative approaches such as ethnography. Recognising this subjectivity demands a closer consideration of positionality. As Woods (2010, p.841) explains 'the qualitative turn in rural geography has been accompanied by a heightened sensitivity to the practice of the research process and to the positionality of the researcher'. This is a term which is used to describe how elements of a researcher's identity such as gender, personality, cultural background and dichotomies such as insider/outsider and, in this case, farmer/non farmer affect fieldwork (Woods, 2010). Feminist and cultural geographers writing during the 1990s-early 2000s such as Rose (1997), Smith (1993), Pini (2004) and Vanderbeck (2005) encouraged researchers to reflect thoroughly on issues relating to their position in the field. However, a direct and comprehensive consideration of positionality did not appear to emerge fully in

the publications of researchers interested in the geography of agriculture at this time (although see exception Hughes *et al.*, 2000). This concern with positionality did receive some criticism which suggested that a focus on the individual researcher amounted to self-obsession and 'navel-gazing' and did not align with the ideals of these geographers to consider marginalised members of society such as women, individuals of different ethnic and geographical backgrounds, and children (see Peach, 2002; Kobayashi, 2003). However, reflecting on an individual researcher's positionality, not for its own merit but within the context of a research project with clear aims and objectives, has prevailed for two main reasons. First, an awareness of the position of a researcher in a specific fieldwork context is important to undertaking ethical practice. For example, Sultana (2007) reflects on how her identity as a researcher in Bangladesh could be confused with the role of local projects who donated equipment for the provision of safe water. An awareness of this element of her positionality enabled her to explain carefully her role and allow participants who had mistakenly assumed that she could provide safe water the opportunity to withdraw without consequence. Second, positionality can influence the methods, engagements, analysis and interpretations of fieldwork (Sultana, 2007). For example, Hopkins (2007) observes how his Scottish nationality and accent created a positionality which enabled him to establish connections, rapport and research engagements with participants with similar characteristics (see also Hill, 2005 on the impact of researchers' physical characteristics on positionality). Unfortunately, there are few published examples that explicitly cite the issue of positionality and undertake this level of detailed and critical consideration. However, Bennett's

(2005b) description of, and reflection on, her 'place' within a farmhouse kitchen reveals clearly that positionality is an important issue within fieldwork (see also Hughes *et al.* (2000) for interesting observations that pertain to positionality in a range of fieldwork contexts), which is worth unpacking as part of broader discussions on methodology.

Positionality is not fixed and stable, but fluid, contingent and 'constantly reworked' over time (Sultana, 2007, p.377). This change may occur unconsciously or unpredictably during research (see Hopkins, 2007). For example, section 4.2 discussed how during the course of long-term ethnography, participants naturally become more trusting, familiar and open. Change can also be consciously guided or instigated by the researcher, usually to create a different position within the fieldwork context that better facilitates the collection of research material. For example, a researcher might adopt similar dress to that of participants to appear similar, less powerful or attentive to religious norms (for e.g. see Okely, 1998). They might also learn a language to show respect and familiarity. However, it is important here to be aware of long-standing and profound problems and criticisms relating to the ethics and capability of a researcher who attempts to create a self-depiction or conduct that is too akin to that of participants (i.e. goes native) (Atkinson & Delamont, 2011; Faubion & Marcus, 2009). In adjusting positionality, the aim is not for the researcher to become the same as participants, but to share some accord in order to establish 'some common ground from which to speak' (Sultana, 2007, p.378). A continual process of reflexive thought and action is instrumental to maintaining this balance.

This section will discuss the elements of positionality that emerged as most significant during the research conducted for this study. The first sub-section will discuss how my identity was presented, perceived and labelled in fieldwork. Sub-section two will explore how my my label as a student challenged the relationship between gender and job roles that was significant at Fferm Ysgawen. The third sub-section will consider contingency to my cultural background and linguistic ability. As appropriate, each sub-section also explores how these elements underwent change, either consciously or unconsciously, during the course of fieldwork. When combined together, it is hoped that this account establishes a comprehensive account of the positionality established during the fieldwork for this study.

4.4.1 Self-identity

Sub-section 4.1.3 described how, on the recommendation of my gatekeeper Rachel, the letter introducing myself and the research to prospective participants referred to me as a 'student'. It was considered that this label was less unfamiliar and overwhelming than the term 'researcher', which suggests 'expert' or 'scientific' demeanour and knowledge (cf. Tsouvalis *et al.*, 2000). In methodological terms, this reduced the power differential that was present between myself and prospective participants.

On arrival at Fferm Ysgawen for the pre-fieldwork visit, it was clear that I was being treated a new guest when Rhiannon put away a mug and reached for the matching crockery set. It was apparent that the newly emerging positionality with participants was characterised by my identity as a guest or a visitor to the family farm. As Sultana (2007, p.379, my emphasis) writes 'the

warmth and hospitality shown, even from the poorest household, with food, tea, a chair or stool to sit on, all further exemplified the sincere generosity that people showed towards a *guest*. As the formal phase of fieldwork commenced and I began to live at Fferm Ysgawen, I started to lose the 'guest' label. Again the use of crockery is a good metaphor for this as I was given a mug of my own to use, which was chosen by Rhiannon because it depicted words in Welsh which was apt for my efforts to learn of the language (see Perkins, 2011). Gradually the label of 'student' that had been attributed to me by Rachel began to become more real as I lived, learnt and worked on the family farm.

As more time passed, the way in which my identity was perceived underwent further change. This was closely related to the way in which I was given more responsibility and freedom to complete tasks on my own, go off the farm to run errands and look over the farm when Llew and the others were away. This is akin to the experience of Bennett (Bennett, 2005b) who found that a clear role, routine and jobs began to emerge during her fieldwork. Sometimes this change in positionality was observed by participants, who described that I had become 'part of the furniture' and a "help to the farm" (Dafydd). However, aware of criticisms of becoming overly familiar and 'going native', I was careful to maintain references to the study, for example by undertaking initial analysis on the farm (see section 4.4). The farm family members themselves were also reminded of my actual role when they introduced me to individuals off the farm using the label 'student'.

4.4.2 Gender and experience

The role of gender in the delegation of work on farms has received some interest from geographers (e.g. Saugeres, 2002; Price & Evans, 2005, 2006; Brandth, 1994). Gender has also been frequently cited as an important aspect of researcher positionality. However, there are no detailed empirical examples of how this has played out in the practicalities of fieldwork conducted by agricultural geographers. It therefore pertinent to consider the possible impact of my gender on fieldwork at Fferm Ysgawen.

On some occasions at Fferm Ysgawen there was a clear distinction between work that was delegated to women, men and children. A key example was during a day spent hay baling when members of the local community came to help the farm family with this significant task (see Chapter 9). The work was delegated as follows: men completed the work outside in the fields of the farm, children helped using smaller machinery and women prepared a home-cooked meal in the farmhouse. Following this pattern, it is clear that my gender as a woman should have led to me helping the women in the farmhouse. This would have created a very distinct gender-driven role and positionality within the farm family.

However, this did not occur. Rather I was encouraged to work outside with the men and the children. I worked with them to lift and transport the bales for storage in the barn. This placement with the men and the children was due to the fact that another element of my positionality came into play. My self-identity as a 'student' who had gained some experience of farm work during my time on the family farm (hay baling took place several months after fieldwork commenced) meant that I was encouraged to work outside with the

men and children. This was because the farm family established a connection between my strong study interest in farming and undertaking a role outside during hay baling. I didn't perceive that I was being treated as a child (perhaps due to my lack of practical experience) or a man (perhaps because of my interest in farming) but that my gender had simply become less important. My interest in farming was considered to be more important than the connection between my gender and the traditional work roles associated with farming women. This indicates that gender is a single aspect of a researcher's identity which relates to other aspects of their positionality (e.g. age, experience) to result in interesting interactions in fieldwork. In addition, as Llew and I continued to complete the baling in the week after the members of the local community had left, he may also have thought that gaining some early experience through working with the other men and children would enable me to help out more when labour resources were not as readily available. This emphasises that positionality is created through the two-way relationship between the researcher and participants. Moreover, while geographers have highlighted the role of the researchers consciously adjusting or modifying their positionality in order to facilitate their research, there has been very little consideration of participants doing the same for their own gain.

4.4.3 Cultural background and language

Sultana (2007) writes about how her fieldwork engagements in Bangladesh were facilitated by her birth in the same country. Despite significant differences between Sultana (2007) and her participants (for example, her urban upbringing, class and education) this similarity encouraged engagement in the research. 'I was after all a *deshi* girl, and talking to a *deshi*

girl (even if an outsider and from the city) was not generally perceived to be a problem' (Sultana, 2007, p.378).

My own birthplace in the country of Wales created a positionality that facilitated engagements in fieldwork. At the most basic level, an awareness of the town of my birth created a sense of familiarity. In a more cultural sense, my Welsh upbringing also created a sense of shared experience as we used common phrases, had similar accents, supported the same rugby team and so on. This aspect of positionality primarily aided settling into the family farm and beginning the formal stage of fieldwork.

However, my birthplace and upbringing in Wales only facilitated engagements to a certain point, as there was a perceived disjuncture between this and my cultural identity. It was clear from the beginning of the period of entering the field that the Welsh language was a significant element of life at the family farm (see Chapter 7). My ability to speak only a very small amount of relatively formal Welsh, gained through compulsory and unpopular classes at school, meant that I was unable to understand or participate in the everyday conversation that took place within the farmhouse. There was also a perception that my lack of proficiency with Welsh impacted my national identity. Rather insightfully, the term "half-caste" was used to describe individuals like me with a Welsh birthplace but an inability to converse in the language (cf. Sultana, 2007 on simultaneously being an insider and an outsider; see also Mullings, 1999; Woods, 2010). Consequently, I was not only unable to understand or speak with participants for a significant amount

of the time, but this also created a detached sense of positionality which was marked by unfamiliarity.

This understanding that my lack of ability to speak Welsh could have a significant detrimental effect on the research led to me undertaking language lessons. After the pre-fieldwork visit to Fferm Ysgawen, I began to learn Welsh using online tutorials/classes, which gave me an effective introduction to conversational Welsh. Following arrival at the farm for the formal phase of fieldwork, I also enrolled in Beginner's Welsh lessons at a local centre which were subsidised by the local council. The regular departure from the family farm to attend these classes and completion of the homework in the evenings integrated my learning of Welsh within the usual activities and engagements. Consequently, family farm members became involved in helping me to complete my homework, practising phrases and pronunciation, and encouraging me to speak Welsh more widely. Both these approaches to learning Welsh were a clear attempt to change my positionality in order to facilitate engagements with participants in the field. I was attempting to create a functional method of communicating and an obvious indication that I was trying hard to fit into the family farm and the local area. In addition, some family members, particularly the children, found that my learning of Welsh and frequent mistakes indicated that the 'student' who could help them with Geography homework also had a lot to learn herself. In this respect, I became more 'real' and 'down to earth'. Following Moser (2002), this reaction by participants to my mistakes, coupled with my own sense of humour and fun allowed personality to become part of the positionality of fieldwork. Moreover,

for those participants who lived outside of Fferm Ysgawen, an ability to converse in Welsh created a sense of friendliness, respect and openness.

The use of translators and interpreters in ethnographic fieldwork has been described as being problematic due to the possibility for fallibility in interpretations and the danger that introducing another individual into the participant-researcher relationship can create an unequal power differential (see e.g. Hopkins, 2007). This account has explored the positive impact that learning a language can have on positionality within ethnographic fieldwork. However, acquiring the ability to converse in a different language is a significant and sometimes challenging commitment. Indeed, it may attract the criticism that I was trying too hard and risking 'going native' (see Atkinson & Delamont, 2011; Faubion & Marcus, 2009). However, adequate ethical distance was maintained because it was clear that, partly due to my long-term residence and study in Worcestershire (England), I was learning Welsh predominantly for the purpose of fieldwork. Consequently, the advantages of learning a language outweigh the disadvantages.

4.4.4 Reflection on positionality

This section has explored aspects of positionality within the context of the ethnographic fieldwork that was carried out for this study. It has provided empirical examples of positionality which included gender, the researcher's self-identity and cultural background. Each sub-section has provided some detailed contributions, so it is apt here to consider two broader areas of reflection. First, sub-section 4.5.2 highlighted that no one element of positionality overrides the others, but that each can interact to cause

occasionally unexpected and multi-layered fieldwork engagements. Second, positionality is not static throughout the duration of fieldwork, but undergoes continual change and flux as a result of the perceptions and actions of both the researcher and participants. For example, sub-section 4.5.1 showed how my identity as perceived by the farm family changed over time, for example from 'student' to 'guest'. Further into fieldwork, my identity returned to that of 'student' but only when they introduced me to other off-farm individuals. I also actively and consciously changed my identity as I learnt Welsh, which facilitated greatly the engagements, understandings and conversations essential to the research.

4.5 Analysis of the fieldwork material

The methods used within this study generated fieldwork material, which was in a written format in a fieldwork diary and larger notebook. The decision was made not to record audible electronically, as the use of a voice recorder was not appropriate within the context of working on the farm. When I completed a test with a voice recorder, I found that trying to handle even a compact model while retaining an active role (e.g. driving a quad bike or feeding the sheep) was impractical and a distraction to the content and 'informal feel' of the discussion. The family members, particularly the children, felt much more comfortable and at ease speaking when a voice recorder was not present. For example, they were reassured that when they were trying to build their confidence conversing with me in English (their second language), that their mistakes wouldn't be recorded. Moreover, considering the time spent on fieldwork at the farm and the experiential focus, the volume and inaudible of

the material collected meant that the use of a recorder was not appropriate. Making notes had the advantage of being discreet for participants, portable, suitable for recording unspoken feelings/emotions, easy to pack away in my pocket, and not reliant on battery life or storage capacity.

Methodological textbooks such as those by Crang & Cook (2007) and Shurmer-Smith (2002) offer some general guidelines on how to complete data analysis. However, the practical implementation of this within individual research projects is rarely depicted in published articles or book chapters, as it is often perceived to constitute unnecessary detail. As a result, I looked at PhD theses such as that by Price (2004) for guidance. Prior to completing formal analysis, Price (2004, p.114) emphasises the importance of critical reflection: 'time was required to digest and reflect on the data gathered'. Consequently, once fieldwork had been completed, time was allowed away from the highly immersed experience of the family farm to reflect and re-consider the results. During this period, I naturally began to re-interpret, organise and conceptualise the material. When I returned to the fieldwork material, I made the decision to conduct formal analysis 'by hand' rather than using software such as SPSS. This decision was based on the significance of the Welsh language, colloquialisms and emotional responses within the material, which would have been difficult to process electronically. I used two different processes to start the analysis.

The first process involved categorising the material according to the theoretical framework and the aims and objectives of the study.

Information created through the ethnographic/multi-sited ethnographic approach and the method of participant observation revealed the individual

actions, practices and tasks carried out within the fieldwork contexts. These instances were recorded in the fieldwork diary in sentences such as 'Llew (a farm family member) filled two sacks with oats and barley for the sheep' or 'we worked together to cover the silage with old tyres and silage pit mats'. One of the main critiques of 'one-off' questionnaire methods is that the lack of time and trust fostered by the researcher means that participants can hide information or not tell the truth, which makes analysis and conceptualisation difficult. In contrast, these observations of actions were unmediated by the opinions of the participants. As a result, these sentences were lifted and placed into a category labelled 'farm action'

The use of the methods of semi-formal interviewing, in-the-field and focused discussions enabled the researcher to identify the reasons and motivations behind these individual actions. Analysis focused on emphasising those which were strong enough to justify more than one action or frequent inclusion in discussions and interviews. In practical terms, this involved systematically working through the material, highlighting the appropriate phrases. For example, the actions described in the previous paragraph were connected by the decision to farm self-sustainably (e.g. growing animal feed on the farm) and conservatively (replacing tyres with silage pit mats gradually to spread the cost). This material was lifted and placed into the category 'motivations'. Over the course of time in the field, trust and openness gradually increased, which enabled the researcher to use the same methods to delve further to reveal the embedded motivations and aspirations of the farm family. For example, when asked why they farmed in a self-sustainable way, the farm family members replied to say that their ultimate aim was to

survive and continue farming. This information was categorised under 'embedded longing'. This category of formed a type of central anchor for the actions and motivations of the farm family. Figure 6 shows a section of fieldwork material that has been analysed in this way during fieldwork. Being able to complete this quick analysis helped me to formulate more detailed questions, which furthered the research.

This form of analysis allowed me to make connections between events, descriptions and observations that enabled me to see the material in its entirety. This was particularly constructive to the process of producing the broad structure of the results chapters of this thesis and envisaging how they would come together to fulfil the study aim. Consequently, the thesis contains three results chapters, according to the tools that were significant on the family farm. These are their own internal dynamics, the use of technology and external connections. Following the broad categories of data analysis, each of these results chapters discusses how these tools were part of the daily life, motivations and deep longings of the farm family members.

The second process of analysis involved returning, in my mind, to the context of the farm family, to present richer and more detailed information. This reflects the concern with the mundane, ordinary and everyday that percolates this research. To do this, I would often re-write or type the material that I had written in my fieldwork diary. Alongside looking at photographs taken in the field, this helped me to recall with great detail 'life on the family farm'. This process made it possible to write about the material placed within the categories in more depth. Structuring this material simply chronologically with contextual information (such as the time of day or weather conditions)

created narratives or stories that provide comprehensive, emotive, and fascinating insights into the life and work of the family farm. This added the detail to the three results chapters.

Figure 6: Example of data analysis

	Focused discussion 19.05.2011
Llew	"Wouldn't it be better if your PhD was on the state of family farming and its future in the UK, rather than having such a focus on technology?" <i>the influence of participants in shaping research</i>
Clare	"Ok then, noting what you've just said about the future of family farming, what do you think needs to change to enable family farms to survive?" <i>key point</i>
Llew	"A re-think of subsidies to ensure that the money goes to the right places NOT the grain barons, or the upland sheep farmers (because they own alot of land) but we need a <u>fair distribution</u> of money for family farmers. A complete overhaul of imports and exports. Farmers are frequently commenting on the <u>injustice</u> of importing beef from America and lamb from New Zealand. <u>Alongside this there is a big emphasis on protecting the rural economy, purchasing goods from the local area.</u> <i>much of this is practice = buying from local area. about broader farming strong feelings and emotion. • policy - not on-farm.</i>
Clare	Potential to think about technology + survival not as a "silver bullet" but as 'part and parcel' of other things on the farm.
Clare	"If we look at the production of all family farms ⁱⁿ the UK, then there's a huge contribution. I was thinking about this at [the abattoir]" <i>-trying to think about survival across all the family farms.</i>
Llew	"Yes, you're right actually. You know that lorry from Dorset in front of us with the 350 lambs. They all come from a <u>collection</u> of family farms, it wasn't one producer." <i>collective</i> <i>the contribution of family farms together is huge their off-farm connections are so significant sense of "the farming community"</i> <i>The distance between family farms & their abattoir can be huge, so why do Ffarms Ysgawen prefer to use one that is so local?</i>

This chapter has discussed the methodological framework for this research. It has explored the ethnographic and multi-ethnographic approach, and individual methods such as semi-formal interviewing, participant observation and focused discussions. The chapter also discussed how these methods were implemented within the context of the family farm and how the material collected through them was analysed. The choice of methods was justified by the aims and objectives of the research, the conceptual framework and a critical evaluation of methods commonly associated with agricultural geography such as 'one-off' questionnaires. The methodological framework as a whole reflects a broad concern with the intricacy of the family farm and its survival within the UK. This provides the basis for the following two chapters, which explore the study area and the family members of the selected farm.

CHAPTER 5: STUDY AREA

This study is focused on the family farm and its survival throughout periods of agricultural change. The literature review and conceptual framework explained how survival may be inherent in the combination of the internal dynamics, use of technology or external links of a family farm. The methodology chapter explained how these objectives were fulfilled by using a (modified) ethnographic approach, which involved living and working on a family farm for an extended period of time of 6 months while simultaneously modifying this to engage with their external connections. This provided a base for the implementation of more specific methods such as semi-formal and focused interviewing at appropriate moments (see Chapter 4).

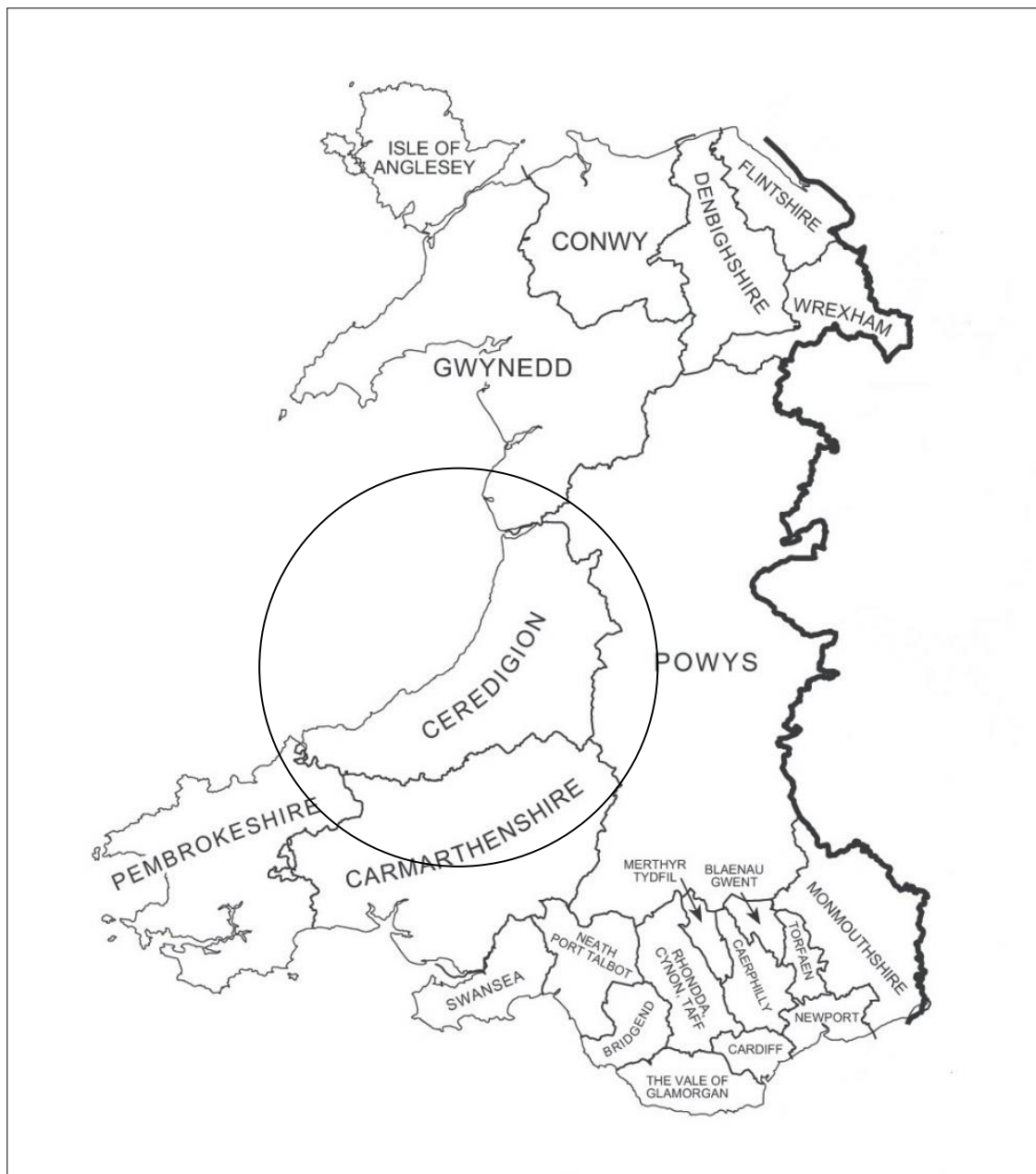
This methodology required a study area that contained family farms. More specifically, these family farms were required to be broadly representative of those discussed by analysts of post-war productivism as struggling to survive (see Chapter 2). Characteristics include relatively small size and the undertaking of management and day-to-day work by farm family members themselves. The county of Ceredigion (Wales) was chosen as family farming is significant in terms of employment, culture, economy and agricultural output (Thomas, 1986; Benbough-Jackson, 2004, Dyfed Cultural Services Department, 2004). Dairy farming is the most significant type of livestock farming in Ceredigion and declining numbers of producers indicates that these family farms are under pressure to survive (DairyCo, 2012). These factors mean that Ceredigion was a particularly appropriate study area within which to conduct this research. The distinctiveness of this study area in relation to family farming and its subsequent role in this thesis means that it is

appropriate to devote this whole chapter to providing a detailed account of its agricultural trends, communities and interest for researchers. This chapter is split into four sections. The first section provides some contextual information on the area. Section two discusses the agricultural policies that regulate farming. The third section explores the agricultural profile of Ceredigion. Finally, section four describes farm-based research that has been conducted within Ceredigion and relevant neighbouring counties.

5.1 Ceredigion

Ceredigion is a county and unitary authority of mid-Wales in the UK. Figure 7 shows that it is a county that is bordered by the sea to the east, the counties of Gwynedd to the north, Powys to the west, Carmarthenshire to the south west and Pembrokeshire to the south east. This positioning towards the east coast means that Ceredigion can be considered a geographically marginal county (Benbough-Jackson, 2004).

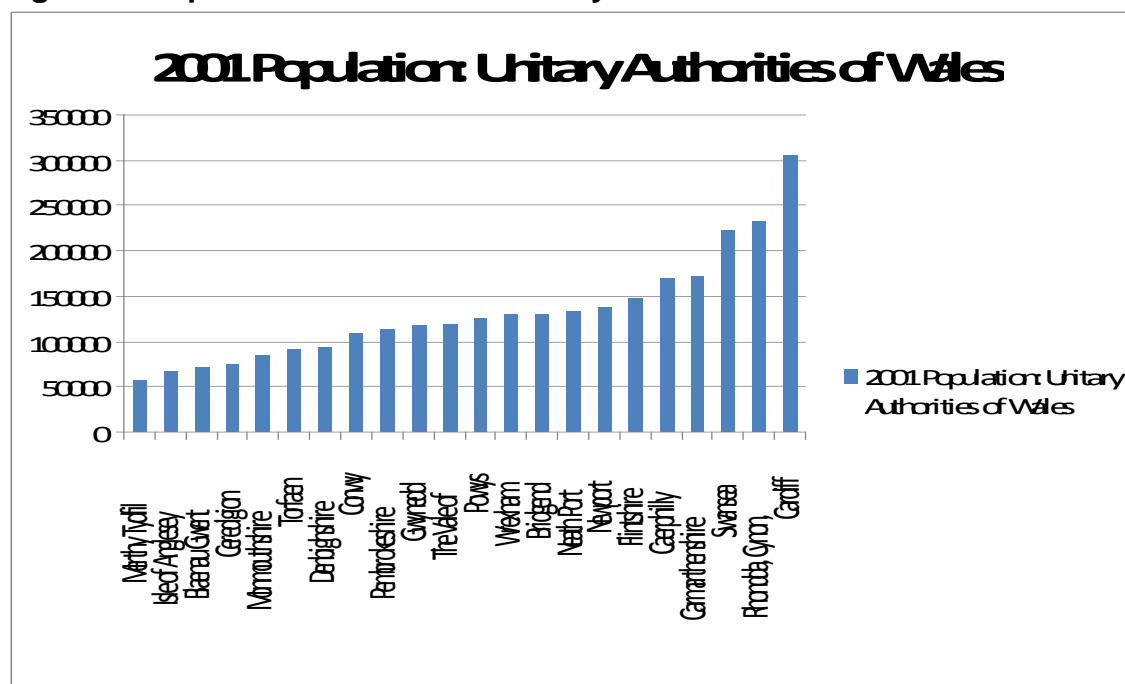
Figure 7: The counties of Wales



Ordnance Survey (2013) Modified by the author

Figure 8 shows that Ceredigion had a population of 74914 in 2001, which was the fourth smallest population out of the 22 local authority districts in Wales (Office for National Statistics, 2004b).

Figure 8: Population numbers in unitary authorities of Wales



Prepared with data from: Office for National Statistics (2004a)

The density of this population was also relatively low in Ceredigion at 0.42 people per hectare, compared with 6.11 people per hectare in Caerphilly local authority district (Office for National Statistics, 2004c). According to the 2001 census, Ceredigion has five urban areas⁴ known as Aberaeron, Aberystwyth, Cardigan, Lampeter and Aberporth (Office for National Statistics, 2004d). Ceredigion also has a number of significant communities⁵, some with populations over 1000 such as Borth, Llanarth, Llandysul, New Quay and Tregaron (Office for National Statistics, 2004f). Ceredigion is widely recognised for its rolling green hills, tradition of pony and cob breeding, livestock farming and tourism (see Jenkins, 2010). Amongst the local people there is a strong sense of Welsh identity which is mediated through the use of the Welsh language. Nearly half (43%) of the population are able to speak,

4 'Urban areas' are defined by the Office for National Statistics (2012) as 'areas or urban land use of 20 hectares or more with 1, 500 residents'

5 'Communities' are defined by the Office for National Statistics (2004e) as areas 'with at least 100 residents and 40 households'.

read and write in Welsh, which is very significant compared to other unitary authorities such as Bridgend, where only 7% can do the same (Office for National Statistics, 2004g). There is also a keen interest in events and activities related to the National Eisteddfod, which is a festival to celebrate Welsh language and culture (see The National Eisteddfod of Wales, nd.). Activities include clog dancing, singing, writing poetry and reciting. Family farming is also a strong tradition and current source of employment, social interaction and culture within Ceredigion (see Dyfed Cultural Services Department, 2004; Thomas, 1986). This combination of arts and music, farming, and the Welsh language is said to make Ceredigion the 'heart' of Wales (Benbough-Jackson, 2004). This is important to discuss as these linguistic and social traditions form a central role in the life of family farms.

5.2 Farming policy, schemes and support

Farmers in Ceredigion are governed through policies, schemes and support services that are administered by the Welsh Government. This governance covers the whole range of production sectors, including sheep, beef, milk, pigs, horses and other animal species (e.g. deer, alpaca and ostrich) (Welsh Government, 2011a). It is maintained by funding through the European Union as part of Pillar 1 and Pillar 2 of the CAP (Welsh Government, 2011b&c). Under Pillar 1, Welsh farmers receive funding for environmentally-aware production through the Single Payment Scheme. Pillar 2, and the Rural Development Plan (RDP) within it, is responsible for the improvement and development of activity in the areas of agriculture and forestry, environment and countryside, quality of life in rural areas, and community regeneration

(Welsh Government, 2011b&c). This is managed through agri-environmental schemes. The Welsh Government also provides a range of informative publications and support schemes and services for farmers (Welsh Government, 2011a). The situation underwent some change as part of reforms during 2013, but the year during which fieldwork for this study took place (2011) means that this regime is the most relevant. The remainder of this sub-section will describe the Welsh policy context in detail in four parts: (i) the Single Payment Scheme (ii) agri-environmental schemes (iii) support schemes and (iv) advice and information.

i) The Single Payment Scheme

Pillar 1 of the CAP means that the Single Payment Scheme offers subsidies to farmers for producing and maintaining land in 'good environmental order' (Welsh Government, 2011d). This is broken down into four requirements. First, farmers must be actively farming and keep their land in good environmental and agricultural condition. Second, the farmer must have access to farm his / her land for at least 10 months of the year. Third, the farmer must keep up-to-date and accurate farm records. This means completing a flock record and herd register, and documenting all cattle movements with the British Cattle Movement Service (BCMS) (see Welsh Government 2011e; Welsh Government 2011f). Fourth, the farmer must comply with regulations related to cross-compliance, which is composed of two elements. The first element involves maintaining land in Good Agricultural and Environmental Condition (GAEC). The second element means compliance to Statutory Management Regulations (SMRs) which relate to the

'environment, public and animal health and animal welfare' (Welsh Government, 2011a). Annual inspections carried out on a percentage of farms check adherence to the requirements of The Single Payment Scheme (Welsh Government, 2011d).

ii) Agri-environmental schemes

Under Pillar 2 of the CAP, four agri-environment or land management schemes are currently significant for Welsh farmers (Welsh Government, 2011h). First, Tir Gofal offers financial rewards for farmers who actively care for the 'environmental, historical and cultural features on their farm' (Welsh Government, 2011h). It connects with the commitment of the Welsh Government to increase the sustainability of farming and the enjoyment of the countryside by the general public. Second, Tir Cynnal offers payments to farmers who protect the 'environmental areas and features' on their whole farm for a minimum time period of five years' (Welsh Government, 2011h). This scheme is similar to the entry level stewardship schemes running in England (see Natural England, 2012). Third, Tir Mynydd compensates farmers in geographical areas deemed to be less favourable. This scheme is in place to support the Less Favoured Areas (LFA) designation (see European Commission, 2009). Approximately 80% of the agricultural land in Wales is designated as less favourable, so this scheme is very significant for a high proportion of farmers (Welsh Government, 2011i). Fourth, the Organic Conversion Scheme supports farmers who are converting their farm from non-organic to organic (Welsh Government, 2011h). Some farmers in Wales are also still receiving payments from the scheme that preceded this, the Organic

Farming Scheme, which required farmers to certify organically their farm for a minimum period of five years. From 2012, the four schemes described here were replaced by a new 'whole farm sustainable land management scheme' known as Glastir (Welsh Government, 2012a). This scheme is now open for applications. Under this scheme, farmers and other landowners are offered financial payments for delivering 'environmental goods and services' which contribute to combating climate change, 'maintaining and enhancing biodiversity' and improving the management of water (Welsh Government, 2012a).

iii) Support schemes

Alongside agri-environment and land management schemes, the Welsh Government runs additional schemes to encourage young people into farming, improve the efficiency and marketing of products, and manage the cultivation of crops. The Young Entrants Support Scheme (YESS) offers a grant for expenses incurred in setting up a farm, advice and mentoring from other farmers, and training (Welsh Government, 2011j). The Supply Chain Efficiency Scheme (SCES) financially supports collaboration within supply chains in order to encourage the development of new products and processes (Welsh Government, 2011k). The Processing and Marketing Grant Scheme (PMG) gives farmers the opportunity to apply for grants to fund investments or activities that add value to agricultural products (Welsh Government, 2011l). Examples include improving the efficiency of business activity, identifying and responding to consumer and market demand, and establishing diversification enterprises (see Welsh Government, 2011l). Two crop schemes were also in

place. First, Aid for Energy Crops (AEC) offers farmers a premium in addition to the Single Payment Scheme to cultivate crops to produce biofuel energy (Welsh Government, 2011m). Second, the Protein Crop Premium also offers additional funding to the Single Payment Scheme for producing crops high in protein such as peas, lupins and beans for animal feed (Welsh Government, 2011m).

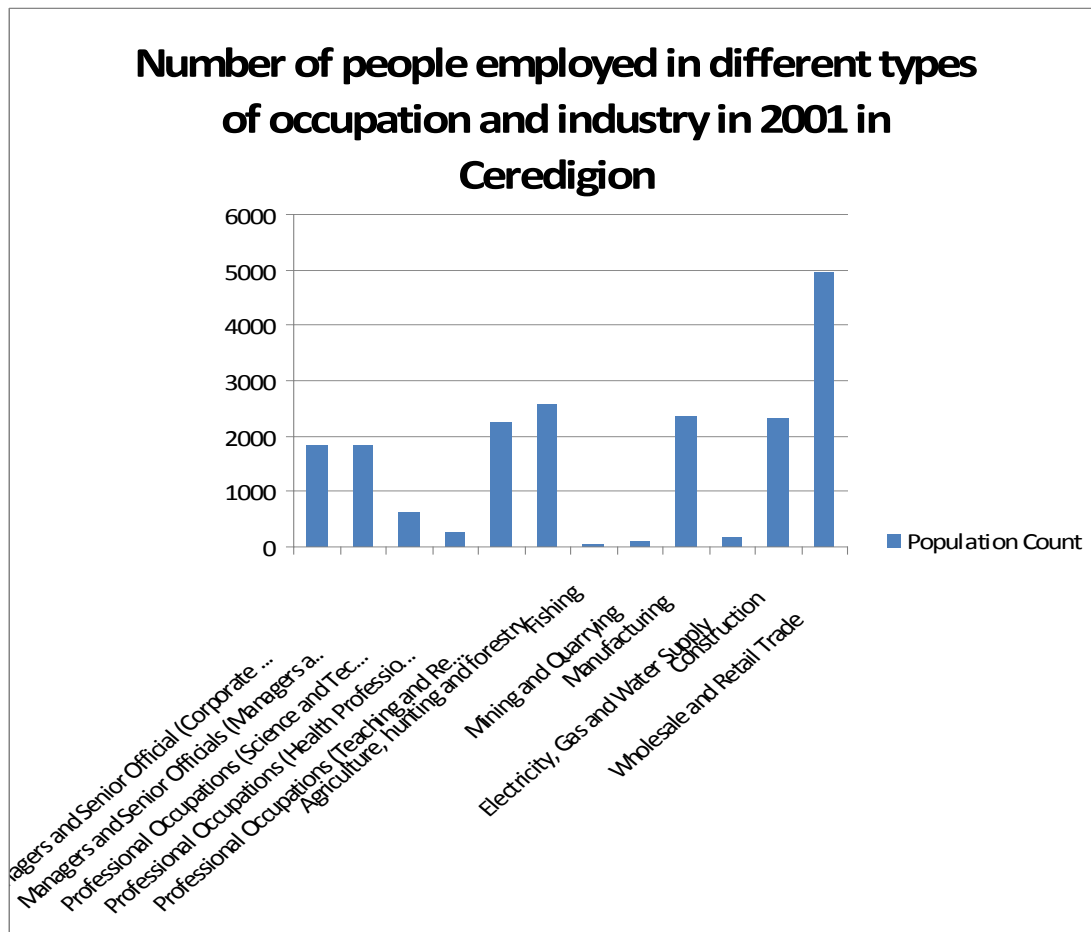
iv) Advice and information

The Welsh Government also provides farmers with advice and information in two key ways. First, a bi-monthly publication known as Gwlad is issued to keep farmers and others involved in Welsh agriculture and rural activity informed of announcements, news and features of interest (Welsh Government, 2012b). Second, the Welsh Government runs a range of advisory and support services. A good example is Farming Connect, which provides part or fully funded guidance, training, development programmes and visits to demonstration farms (Welsh Government 2011n&o). Another example is the Farm Advisory Service, which can offer (subject to application) partly funded farm visits by approved advisers who give one-to-one confidential guidance on how to satisfy the requirements of cross-compliance policy (Welsh Government, 2011p). In addition, the Farm Liaison Service offers fully-funded advice on more general policy (from the single payment to agri-environmental schemes) and issues such as form-filling and record keeping (Welsh Government, 2011q).

5.3 Farming in Ceredigion

Ceredigion has traditionally been associated with main industries including wool production, pony and cob breeding, mining for lead and tin, and farming (Thomas, 1986; Jenkins, 2010). In recent years, tourism has become increasingly prevalent along the coastline. Data from the 2001 census shows that agriculture, hunting and forestry is the second largest source of employment within Ceredigion, which indicates its significance within the area (see figure 9). The significance of farming and the increase of tourism suggests that there are a range of activities for family farmers to become involved in.

Figure 9: The number of people employed in different types of occupation and industry in 2001 in Ceredigion



Prepared with data from: Office for National Statistics (2004h)

This section will explore the different types of agriculture that are important within Ceredigion. To offer some geographical context, it will compare and contrast these farming types to those across Wales and England. Using Coppock's (1964) agricultural atlas, it will also highlight changes in Welsh farming immediately in the years following the Second World War. However, before proceeding, it is important to highlight five key issues that relate to the data and literature used to complete this sub-section.

i) Different sources of data

Since the devolution of the Welsh Government, responsibility for distributing and collating data from the agricultural census lies with two different departments. In Wales, the Welsh Government is responsible, and in England, Defra is responsible. This means that the data are available from different sources. Data from the 2010 agricultural census in Wales may be found through the Welsh Government, and these data may be accessed and mapped using the EDINA agcensus service (EDINA agcensus, 2012).

However, the EDINA agcensus service does not contain data from the Agricultural Census in England beyond 2004. More recent data, from the 2010 agricultural census in England is published online by Defra on their website (Defra, 2011a). This means that in order to compare agricultural census data between England and Wales, different sources and services must be used to map the data.

ii) Different agricultural censuses

Second, differences in agricultural policy related to the devolution of the Welsh Government means that the form of the agricultural census is different across England and Wales. For example, farmers in Wales may be asked about their participation in agri-environmental schemes such as Tir Gorfal and Tir Mynydd, while farmers in England may be asked about agri-environmental schemes such as Entry Level Stewardship. As a result, it is difficult to use some agricultural census data to make comparisons across England and Wales.

iii) Census data are analysed in different ways

Census data are collated and categorised in different ways by EDINA and Defra. For example, EDINA uses 'groups of items' such as 'Crops and Fallow' to categorise the items of stockfeed, cereals, potatoes and horticulture. For similar items, Defra uses the category 'Cereals and oilseeds'. In addition, the items within categories also differ. For example, 'plants and flowers' are contained within Defra's 'Cereals and oilseeds' category but do not appear in EDINA's 'Crops and Fallow' item group. Consequently, it is only possible to highlight general trends in farming types, especially when comparing between England and Wales.

iv) Data collection methods have changed over time

Since Coppock's (1964) work, methods of collecting and collating census data have undergone substantial change (see Keep, 2009; Southall & Aucott, nd.). For example, Coppock (1964) includes the items or turnips, swedes and kohlrabi in the category 'Tillage Crops' which otherwise would have been akin to EDINA's 'Crops and Fallow' and Defra's 'Cereals and oilseeds'. Therefore, as above, it is only possible to use these data and literature to indicate general trends in farming types, especially when attempting geographical or historical comparisons.

v) Different units of measurement

Different units of measurement are used for different agricultural sectors. For example, crop cultivation is measured in hectares but livestock are usually quantified through headcounts. This means that it is very difficult to compare

sectors in order to highlight the most significant or dominant type.

Furthermore, as different types of livestock (e.g. cows and sheep) attract different economic returns, it is also problematic to suggest significant or dominant items using headcounts.

These five issues mean that the data provided by this range of sources do not provide a complete and highly accurate picture of farming types across England and Wales (see Keep, 2009). However, despite these issues, it is possible to use the data to suggest indicative farming types and trends (see Keep, 2009). This offers an indication of the types of activities and practices available to family farmers. As a result, this sub-section is only concerned with exploring three farming types that are most significant for this study: 'Crops', 'Cattle' and 'Sheep'. Figure 10 shows which category of item groups within the data / literature are used to construct a picture of each of these farming types. In order to make it more manageable to compare across the two counties of England and Wales, and between 1958 and 2010 in Wales, the sub-section will focus on illustrating the farming type with just one or two examples of specific items. To demonstrate the 'Crops' farming type, the most and least significant crops will be highlighted. Numbers of beef and dairy cows will be used to illustrate 'Cattle'. Finally, total numbers of sheep will indicate the importance of 'Sheep'. The distribution of farming types (e.g. cattle) and illustrative items (e.g. dairy cows) will be described for Ceredigion and, as the primary geographical context of the unitary authority, Wales. This method is summarised in Figure 10:

Figure 10: Data selected for description of farming type

County / Country	Date of data	Source of Data	Farming type equivalent	Items within category	Example
Ceredigion	2010	EDINA AgCensus (2012) Welsh Government	Crops and Fallow	Stockfeed (sf), Other cereals, Potatoes, Horticulture, Other crops, Crops and horticulture, Barley, Wheat, Maize	Most significant Least significant
			Cattle	Total cattle, Dairy breeding, Beef breeding, Calves, Other cattle	Dairy breeding
			Sheep	Total sheep, breeding ewes, Rams, Lambs, Other sheep	Total sheep
Wales	2010	EDINA AgCensus (2012) Welsh Government	Crops and Fallow	Stockfeed (sf), Other cereals, Potatoes, Horticulture, Other crops, Crops and horticulture, Barley, Wheat, Maize	Most significant Least significant
			Cattle	Total cattle, Dairy breeding, Beef breeding, Calves, Other cattle	Dairy breeding Beef breeding
			Sheep	Total sheep, Breeding ewes, Rams, Lambs, Other sheep	Total sheep
Wales	1958	Coppock (1964)	Tillage Crops	Total cereals, Wheat, Barley, Oats, Mixed Corn, Rye, Potatoes, Early potatoes, Sugar-beet, Turnips, Swedes, Mangolds, Fodder-beet, Cabbage (sf), Kale (sf), Savoys (sf), Kohl Rabi (sf), Rape, Vetches, Beans (sf), Peas (sf)	Most significant Least significant
			Livestock	Total cattle, Dairy cattle, Dairy cows, Herd replacements, Beef cattle, Breeding, Rearing, Fattening	Dairy cattle Dairy cows
			Livestock	Total sheep	Total sheep
England	2010	Defra	Cereals and oilseeds	Total cereals, Wheat, Barley, Oats, Oilseed rape, Linseed, Sugar beet and sugar, Peas and Beans (harvested dry), Fresh vegetables, Plants and flowers, Potatoes, Fresh fruit	Most significant Least significant
			Livestock	Total beef and veal, Dairy cows, Beef cows, Steers, heifers and young bulls, Calves, Cows and adult bulls, Milk	Dairy cows Beef cows
			Livestock	Total sheep and lambs, Mutton and lamb, Ewes and shearlings, Lambs, Sheep and lambs, Ewes and rams	Total sheep

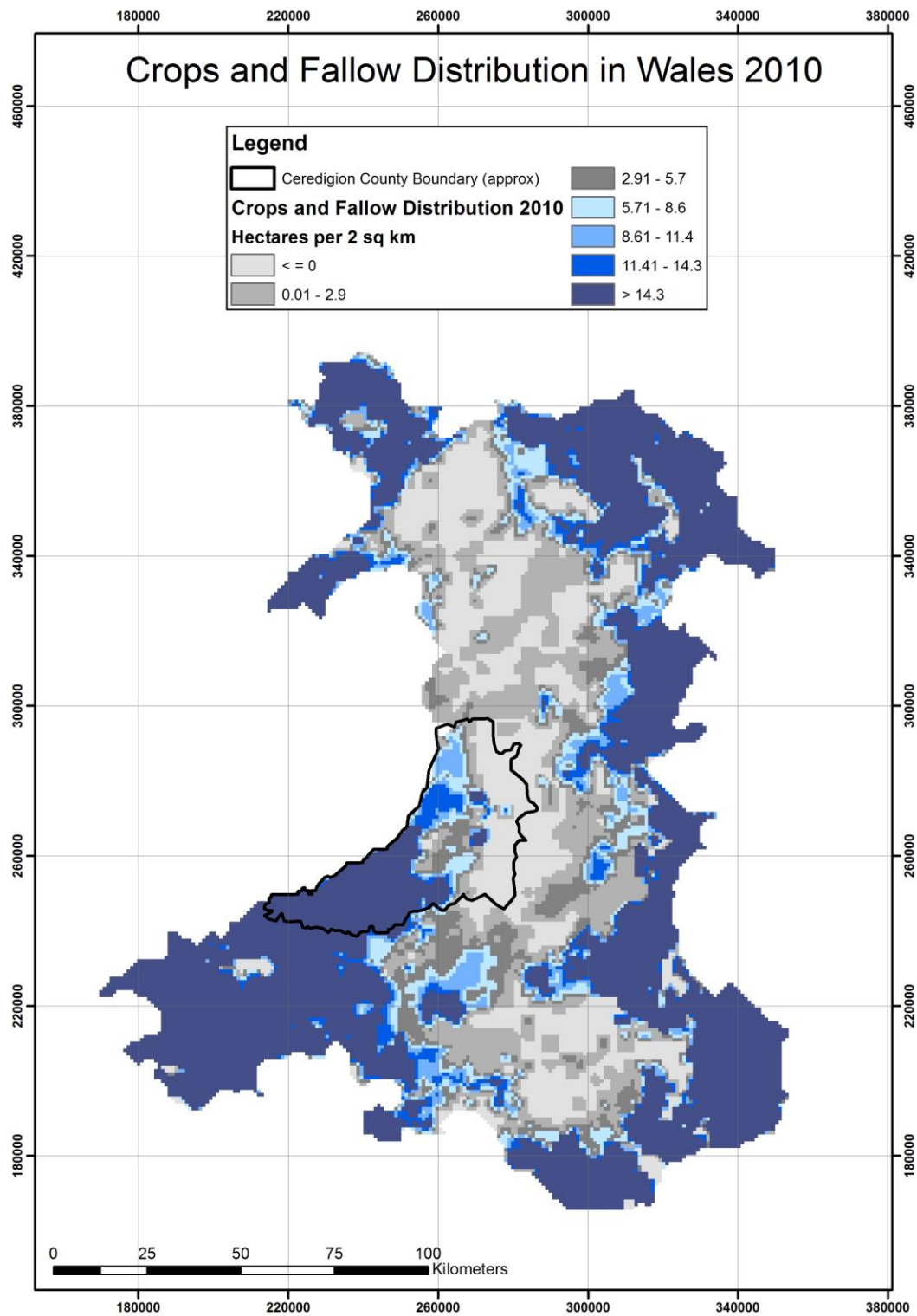
The remainder of this section will provide an account of the agricultural change in Ceredigion, compared to the wider context of Wales and England. In order to understand the significance of family farmers in this county, it is appropriate to consider the distinctiveness of this area in relation to broader agricultural contexts. It is split into four inter-related paragraphs. The first is concerned with describing farming types in Ceredigion in 2010. Section two considers how these types relate to the broader Welsh context. The third section looks at how farming types within Wales have changed between 1958 and 2010. Finally, section four will describe how these farming types compare to the agricultural context in England.

i) Farming in Ceredigion in 2010

In Ceredigion in 2010, 4094ha were used for cultivating crops and horticulture (Welsh Government, 2011t). Using the EDINA agcensus service to map 'Crops and Fallow' indicates that this cultivation is heavily concentrated to the south west border of the county with Pembrokeshire, although there are a few small clusters elsewhere (see Figure 11). This is perhaps due to the lowland landscape and mild weather conditions, which makes the area more appropriate for crop production than the inland uplands. The most significant crop in 2010 was barley, which was grown on 1645ha (Welsh Government, 2011t). The least significant major crop was potatoes, which was cultivated on just 53 hectares (Welsh Government, 2011t). The total number of cattle in 2010 was 107,358 (Welsh Government, 2011t). Similar to the distribution of crops and fallow, cattle are concentrated towards the south west of the unitary authority (see Figure 12). Again, it is likely that is due to the lowland

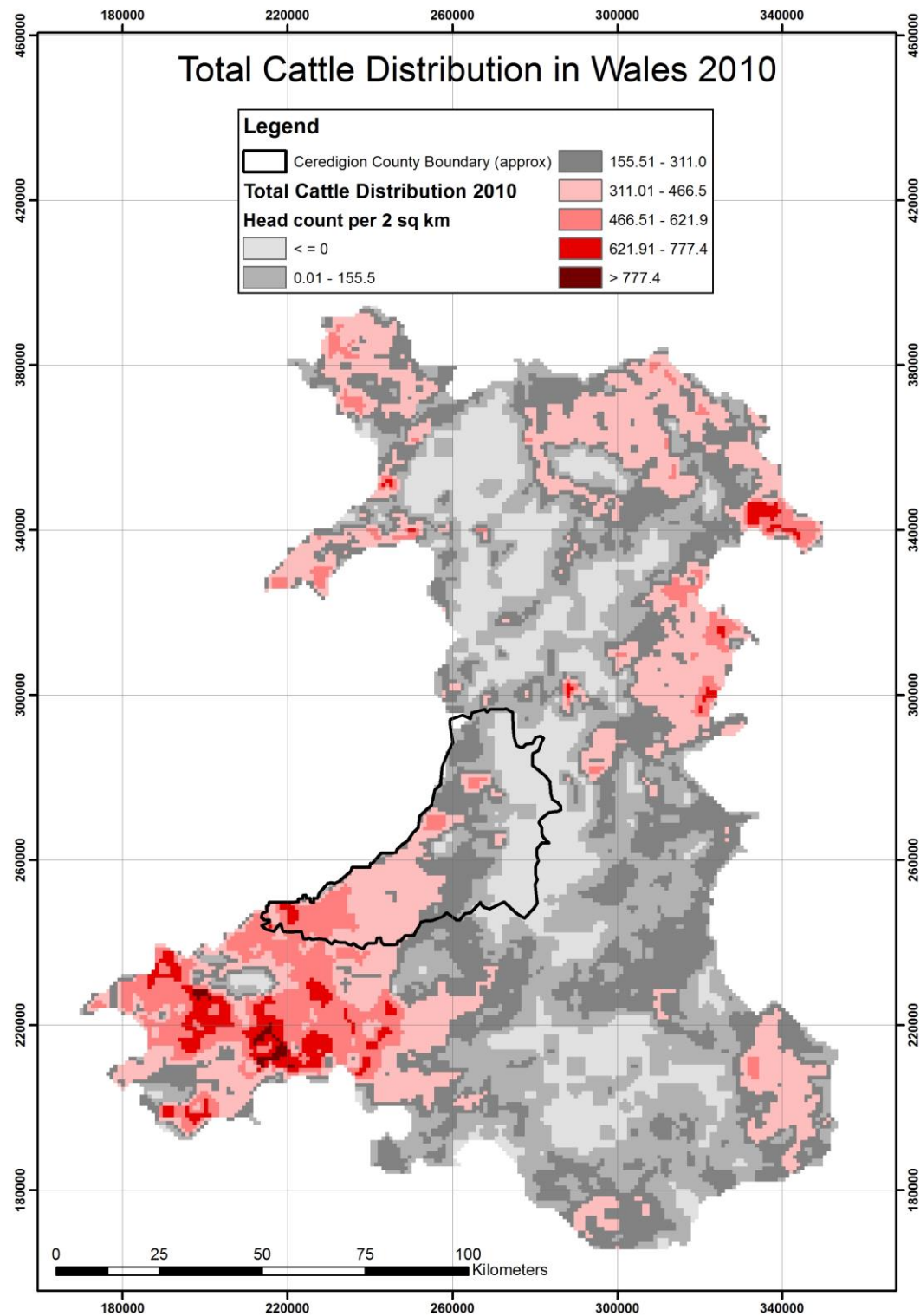
landscape and favourable climate. Within the cattle farming type, dairy farming was the most significant with 31,379 cows compared to 20,052 non-dairy cows (Welsh Government, 2011t). The total sheep count for Ceredigion in 2010 was 744,858 (Welsh Government, 2011t). Sheep are concentrated towards the east of the county, where the higher land and colder weather conditions are better suited to hardier livestock.

Figure 11: 2010 distribution of crops and fallow



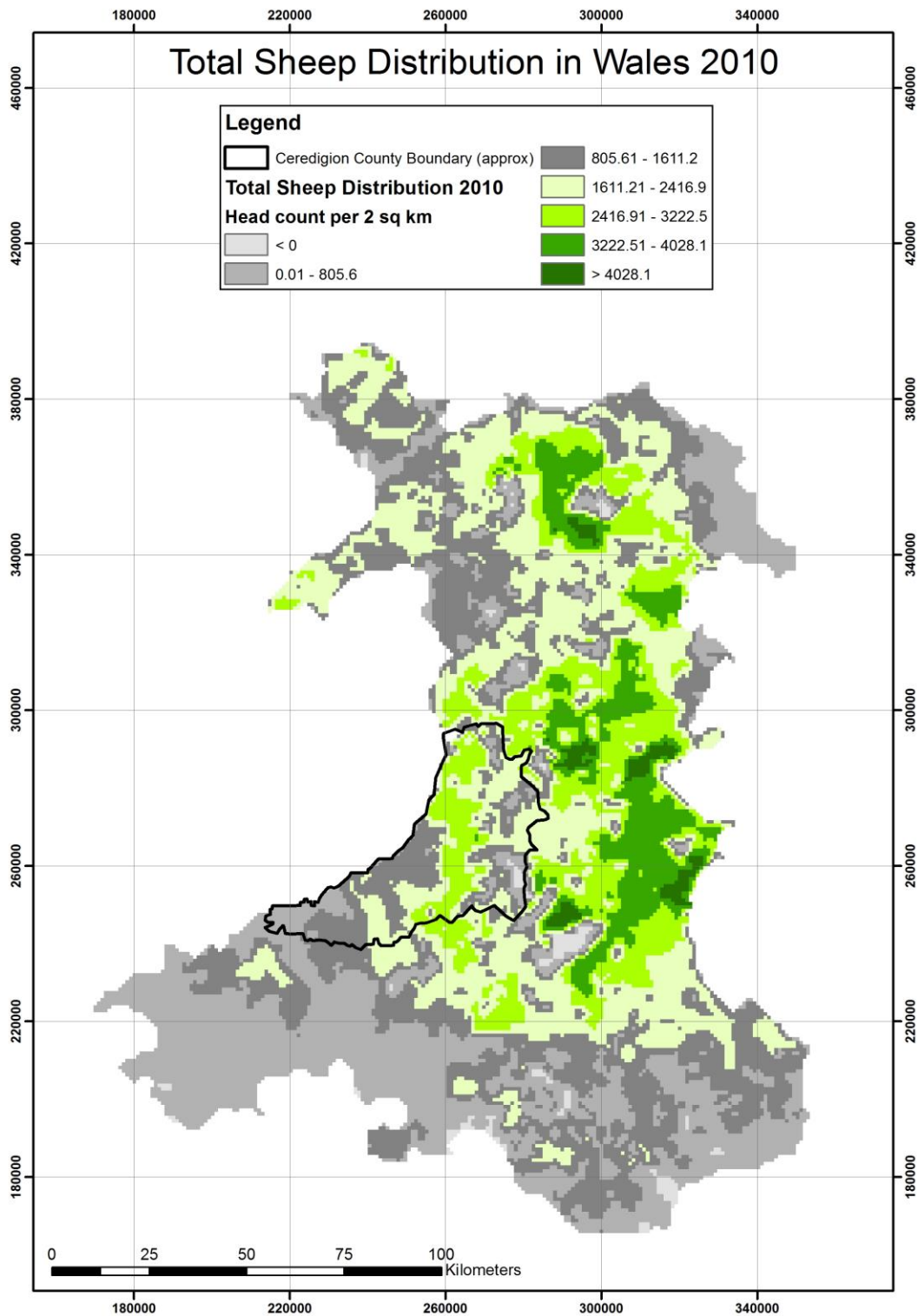
Produced with data from EDINA Agcensus (2012)

Figure 12: 2010 distribution of cattle



Produced with data from EDINA Agensus (2012)

Figure 13: 2010 distribution of sheep



Produced with data from EDINA Agcensus (2012)

ii) Farming in Wales in 2010

The year 2010 is the most recent year which presents comprehensive data/full agriculture census returns. The trends in farming evident in the county of Ceredigion are generally reflected within the broader Welsh context. For example, according to estimates provided by the Welsh Government (2011r&s), the most significant farm type in Wales in 2010 in terms of income was cattle at £269.6 million. Least significant was cereal production, which was estimated to provide £62.7 million⁶ (Welsh Government 2011r). The Welsh Government (2011t) records that 83,584 ha were used for producing crops and horticulture. Reflective of the Ceredigion context, barley was the most significant crop in Wales (24,275 ha) (Welsh Government, 2011t). However, horticulture other than potatoes was the least significant crop, being planted on just 1,259 ha (Welsh Government, 2001t). Across Wales, the cultivation of crops and fallow is located on the borders of the country, with a particular concentration in the south west (see Figure 11). The total headcount for cattle in 2010 was 274,412 (Welsh Government, 2011t). Cattle are predominantly located in the south western unitary authority of Pembrokeshire, but other concentrations may be found towards the north east (see figure 12). Similar to Ceredigion, there were slightly more dairy (274,412) than non-dairy (256,690) cows (Welsh Government, 2011t). There were 8237,737 sheep in Wales in 2010, and these were to be found in a wide band running from north to south which covered most of mid and eastern Wales (see Figure 13).

6

This amount is equal to the output created by 'Cereals', 'Other crops', 'Potatoes', and 'Horticulture' (see Welsh Government, 2011r)

iii) Farming in England in 2010

In England in 2010, Defra (2010a) note that 3,013,000 ha were used for crop cultivation. In contrast to Wales, wheat was the most significant crop, with 1939,000 hectares being used to cultivate it (Defra, 2010a). This is in contrast to the most significant crop of barley identified in Ceredigion and Wales.

Linseed, plants and flowers, and fresh fruit were the least significant, with 44, 18 and 29 hectares respectively being used to cultivate these crops (Defra, 2010a). The cattle farming type was composed of 10,112 cattle and calves (Defra, 2010a). Within the type, reflective of the Welsh contexts, dairy cows were slightly more significant at 1847 cows and beef cows at 1657 (Defra, 2010a). The total number of sheep was 31, 084, which is very much significantly lower than the total for Wales (8,237,737) (Defra, 2010a).

iv) Agricultural change in Wales between 1958 and 2010

Coppock's (1964) analysis of agricultural census data collected in 1958 describes that Wales was not an important producer of crops. When they were grown, in stark contrast to the 2010 data, oats were 'the leading cereal' (Coppock, 1964, p.69). Mixed corn was the second most significant crop. Both these crops were used for feeding livestock (Coppock, 1964). The least significant crops were wheat and barley (Coppock, 1964). Coppock (1964, p.160) describes concentrations of cattle 'to the east of the Welsh uplands' and around Pembroke and Carmarthen. Dairy cows were important on most farms in 1958 as milk was 'the most important single product sold off farms in England and Wales' (Coppock, 1964, p.161). South Carmarthenshire was an

important area for dairy farming (Coppock, 1964). This was due to a standardisation of the price paid for milk by the Milk Marketing Board, which resulted in the elimination of transport costs. As a result, farmers in this area were able to embrace the opportunity of ideal land and guaranteed milk prices to maintain their success. Rearing beef cattle was a 'much less important enterprise' and beef was often considered a by-product of dairy farming (Coppock, 1964, p.168). Nevertheless, the area of the Welsh borderland had the greatest concentration of beef cattle for breeding (Coppock, 1964). This great significance of dairy over beef farming is in distinct contrast to the slight differences between the headcounts of beef and dairy cows recorded in 2010. Coppock (1964) describes sheep as much less important than cattle across Wales in 1958. However, where sheep are present, they tend to be the primary farming type and rarely form part of a mixed farming type (Coppock, 1964). The largest concentration of sheep across England and Wales was located in the Welsh uplands (Coppock, 1964). Interestingly, while cattle dominated the south eastern areas of Wales (i.e. the areas surrounding Carmarthen and Pembroke), sheep are notably absent (see Coppock, 1964).

5.4 Research in Ceredigion and neighbouring areas

Ceredigion has been the focus of work which utilises a predominantly sociological or anthropological approach since the 1950s up to the present day. Inspired by social anthropology work that promoted study within the UK, prominent themes were the way of life and form of the communities within the county, notions of Welsh identity and language, and experiences of farming (see Jackson, 1987; Emmett, 1982a&b; Frankenberg, 1957). For example,

Davies and Rees' (1960) encouragement of researchers from within rural Wales to conduct studies on Welsh communities builds on a criticism of Frankenberg's research on a village in North Wales. They discuss that as Frankenberg (1957) was 'not of the culture' important issues such as the social values underpinned by the chapel are neglected in favour of an exploration of peripheral elements of the community such as the football club and local government (Davies & Rees, 1960, p.xi). Within agricultural geography, there has been some interest in the communities of Ceredigion (e.g. Rees, 1961; Frankenburg, 1957). These studies are driven by an ideology known as 'the rural idyll' where rural or country life is perceived as more wholesome and rewarding than that in urban areas. There has also been interest in the neighbouring county of Powys (Price, 2004; Wilson, 1996; Price & Evans 2009). Within this research, agriculture forms a common theme, which reflects its role within these communities. The remainder of this sub-section will explore the research on Ceredigion, with reference to neighbouring Welsh counties as appropriate.

i) Research in Ceredigion

Studies conducted in Ceredigion and other Welsh counties follow a broadly social anthropological approach, which involves the use of methods such as surveys, questionnaires, participant observation and interviews (e.g. Rees, 1961; Jones, 1993; Jenkins, 1960; Jones, 1960). These methods were used to chart and analyse communities, genealogies, house layouts and social rules/structures (e.g. Frankenberg, 1957). Material was commonly used to theorise community structure and social groups (e.g. Jenkins, 1960), cultural

differences between Wales and England (e.g. Rees, 1961), and notions of national identity and 'Welshness' (eg. Emmett, 1982). In one case, theories developed through social anthropological study of 'tribal society' were applied 'to a community in Britain' (Gluckman, 1957, p.7; see Frankenberg, 1957). Although not the explicit theme, the location of these communities and the time in which the research was conducted means that farming is important within this literature. Agricultural traditions and norms, seasonal routines, and forms of production are discussed in great depth. Studies undertaken in Wales but outside of Ceredigion by Frankenberg (1957) and Rees (1961) highlight the significance of family farming. For example, Rees (1961, p.60) states that 'the family farm is the basic institution of the Welsh countryside'. Studies of this genre then go on to explore family farms by considering their inter-familial and human-animal relationships, changes under industrialisation, and interactions with the wider community. For example, Rees (1961, p.56) discusses how the introduction of mobile-threshing machines under industrialisation turned threshing into a 'periodic event' as farmers had to share the machine and help each other to use it. Rees (1961) also describes how individuals within farm families relate to each other through the distribution of activities and jobs. He states that on large family farms 'with several brothers [...], the eldest is always in charge of the horses, the second being the cowman and the third shepherd' (Rees, 1961, p.59). Rees (1961) states that farm family members also interact with their animals in ways that reflect their own culture and language (cf. Gray, 1996). Rees (1961, p.58) describes how 'Welsh words are used for almost everything relating to cattle but a large number of English words have been introduced to describe

horses'. To illustrate, cows are given 'homely Welsh names' such as Cochen or Frochwen, while horses are given 'aristocratic' English names such as Prince and Duke (Rees, 1961, p.58).

Frankenberg (1957) is concerned with the multiple ways in which farm families interact with the wider community. He describes how farmers visit the village to go to the public house or shops, share local news with their wives on their return home, attend social and Chapel events, employ village people as labourers, and support local country shows and sales. In return, village people help farmers with key activities during the farm year such as harvest and potato-picking. These activities indicate the dominance of farming within the communities and rural spaces. However, more recent work conducted by Price and Evans (2009) in Powys reveals how farmers feel isolated from other farmers and social contacts so rarely visit places such as pubs. This suggests that the social or leisure elements of farming may have undergone substantial change over time.

Studies also discuss the role of agriculture and family farming to the urban areas within Ceredigion, such as Tregaron and Aberporth (Jones, 1960; Jenkins, 1960). Jones (1960) describes how Tregaron had a long-standing connection with agriculture. At various points in history, Tregaron was the location of national country fairs, 'the centre of the cattle trade', important to the wool industry and as a marketplace for agricultural goods (Jones, 1960, p.73). It was also a point of administration, education, retail and cattle trading for the surrounding upland area (Jones, 1960). The town market and mart on a Tuesday brought farmers and cattle drovers into town to sell their goods and put their money into the bank, and their wives to purchase goods from the

shops and catch up with the news, and dealers to buy cattle and sheep. The surrounding area around Tregaron was also important for rearing livestock, especially dairy cattle and some sheep. Jones (1960, p.85) states that farms were 'uniformly medium sized, averaging around 80 acres [32.3 ha]', are characterised by livestock and subsistence farming. Milk, butter and cheese, and vegetables were produced for consumption at home (Jones, 1960). Jones (1960, p.104) observed that the children of the farm were brought up to farm from an early age by being taught at 'the hearth'. However, the 1950s had seen a decline in school-leavers going into agriculture as they preferred to take up employment opportunities elsewhere (Jones, 1960, p.104).

Jenkins' (1960) study of Aber-porth reveals that most of the countryside around the town was excellent for farming due to the open land on the tops of the cliffs and valleys, and plentiful water supply. Jenkins (1960, p.5-6) writes that the number of farms 'has increased during the last hundred years or so' by the fragmentation of farmland which has meant a drop in average acreage from 66.5 to 49 (26.9 ha to 19.8 ha). Although farming is considered a 'hereditary calling' as keeping 'one's names on the land' is important, Jenkins (1960, pp.15, 30) remarks on the decline in numbers of family farms. This is partly the result of 'economic necessity', but also due to the owners of family farmers retaining their position as long as possible, which means that their children take up opportunities elsewhere (Jenkins, 1960, pp.31-33). The Aber-porth area had been used to farm a range of animals and crops including pigs, sheep, potatoes, stockfeed and breeding horses for shows (Jenkins, 1960). However, cattle were the most 'important element in the farming economy; so much so that farms are assessed not by their

acreage but by the number of cattle they can carry' (Jenkins, 1960, p.36). Moreover, Jenkins (1960, p.36) notes that between 1910 and 1960 there had been a 'great change over from beef and store cattle to cattle for milk production'. Cooperation amongst family farmers was important, with help and machinery being shared 'on a reciprocal basis' (Jenkins, 1960, p.40). However, some family farmers felt that this practice was 'not as strong as [it was] in the past' (Jenkins, 1960, p.40). Nevertheless, farm families still met several times during the year at the local marts and auctions held at Cardigan and Newcastle Emlyn (Jenkins, 1960).

Jones (1993) explores her own and other local people's experiences of living in rural Ceredigion. Farming is central to the economy, employment opportunities and culture of Ceredigion (Jones, 1993). Jones (1993) provides a detailed and in-depth view of agricultural activities and events, which have undergone significant change as a result of industrialisation. For example, Jones (1993) describes the seasonal routine of sheep farming, which is completed by farmers who are motivated by productivist attitudes (Jones, 1993). Productivism is seen in the pride of turning 'unpromising hill land into good pasture' after their and their parents' long struggle (Jones, 1993, p.52). This also explains a reluctance of farmers to enter into agri-environmental schemes, which might mean returning their land to its unimproved condition (Jones, 1993, p.52). Jones (1993) describes how prior to industrialisation, farmers were also motivated by competition and co-operation with individuals off the farm. This encouraged farm families to know about and support each other's farming activity, compete against each other in local shows and competitions, and help one another with large tasks such as hay making

(Jones, 1993). Contrary to Rees' (1961) argument that the expense and labour involved in new machinery such as mobile threshing machines have made helping each other more important, Jones (1993) states that increased machinery has made farming less sociable and cooperative. Jones (1993) also highlights challenges facing farmers in Ceredigion such as the decreasing price of wool, increasing cost of inputs such as fertilizer and the loss of young people on the farm to employment opportunities in urban areas.

ii) Agricultural geography on Ceredigion and neighbouring counties/regions.

There has been a severe neglect of Ceredigion within agricultural geography, but there has been some interest in the regions of Powys and the Cambrian Mountains from Price (2004) and Wilson (1997). Wilson (1997) explores the factors that influence farmers' former participation in the Environmentally Sensitive Areas scheme (ESA) in the Cambrian, which is a region that covers the counties of Ceredigion, Carmarthenshire and Powys. Through this research, Wilson (1997, p.75) identified characteristics of the region such as a limited range of agricultural types (cattle and sheep), relatively low numbers of livestock that are dispersed over a large area of land (although this has increased due to intensification) and the predominance of 'improved pasture' and 'semi-natural rough grazing (including heather)'. As a result, the region is designated as a Less Favoured Area, which allows farmers additional subsidy.

Price (2005) investigates the patriarchal way of life and stress experienced by family farmers. In so doing, Price (2005) provides a detailed

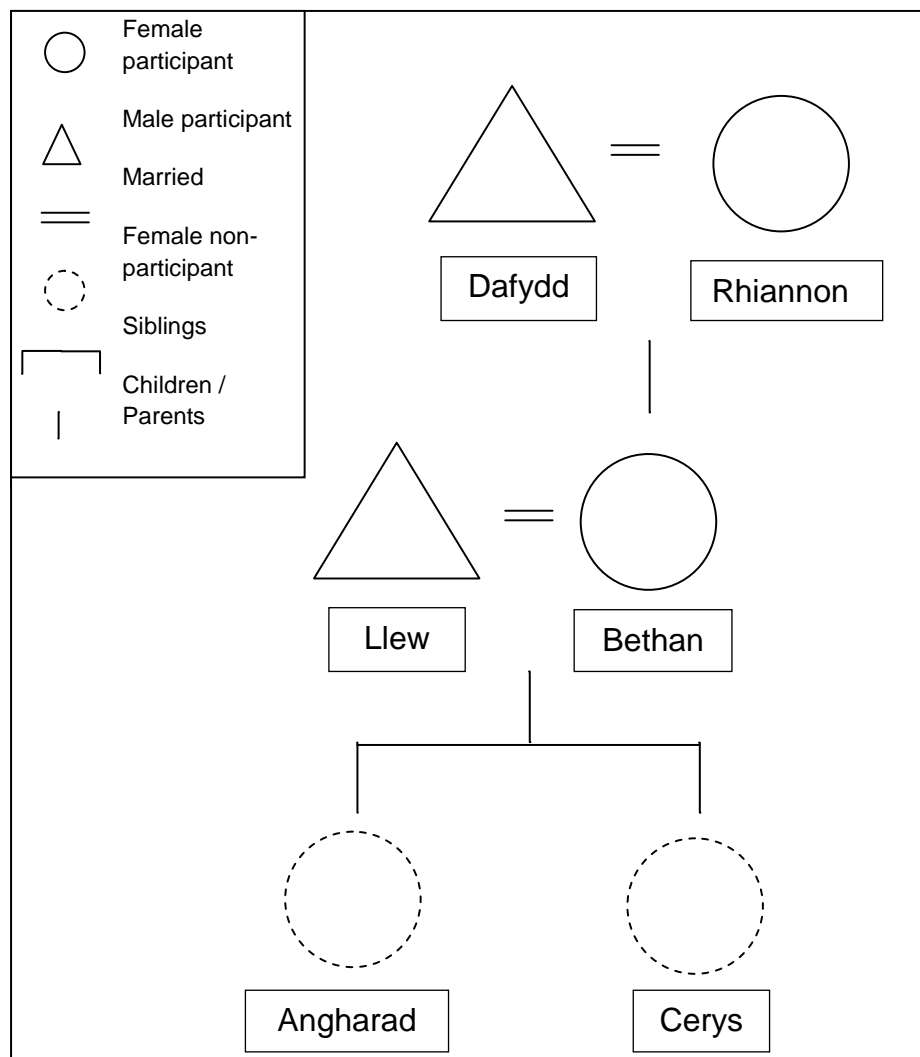
account of the agricultural land. Powys contains approximately 418,000 ha of farming land, out of which 176,000 ha is designated as a less favoured area. Mixed farming with a specialisation in sheep is the most significant farming type (Price, 2005) Many farmers are also involved in the Tir Gofal agri-environmental scheme (Price, 2004). Farm families are very important within this agricultural context. Family members complete most of the farm work (although contractors may be employed to help with seasonal events such as shearing), which is distributed according to age and gender (Price, 2005). Children are brought up to aspire to succeed and inherit the family farm (Price, 2005). Sheep market towns in Powys such as Welshpool provide a location for farm families to meet and socialise (Price, 2004; Williams 2010).

This chapter has explored the study area of Ceredigion. It has illustrated the presence and significance of family farming within its farming, community and cultural life. It has also demonstrated that within this county, there has been less possibility for the application of corporate/capitalist forces disadvantageous to the family farm. This chapter provides the basis for focus on the individuals connected to the family farm at the centre of this study.

CHAPTER 6: CHARACTER LIST

The aims and objectives of this study made the selection of a single family farm appropriate for the implementation of an ethnographic/multi-sited ethnographic approach. Following common protocol amongst researchers who use this approach, a pseudonym was used. The family farm will be known as Fferm Ysgawen for the remainder of this study. Fferm Ysgawen is composed of four adults and two children who are connected by familial or kinship relations. A diagram showing the familial relationships between them provides a resource for reference when reading Chapter 7. Below is a kinship diagram of Fferm Ysgawen (Figure 14):

Figure 14: Kinship diagram of Fferm Ysgawen



Objective three of this study is concerned with the relationships Fferm Ysgawen has with individuals, business and institutions outside of the boundary of the family farm. Family friends of Family Farm A also became key participants in the study. Moreover, following methodological discussions in agricultural geography around the subjective creation of knowledge in the field by researchers themselves (see Chapter 3), I myself became a participant in the study. The following table (Figure 15) offers some details about each participant, their gender and occupation.

Figure 15: Table of Participants

Character	Male / Female	Occupation
Llew	Male	Family farmer
Bethan	Female	Assistant head teacher
Dafydd	Male	Semi-retired family farmer
Rhiannon	Female	Semi-retired family farmer's wife
Aled	Male	Agent for the National Farmers Union and sheep breeder
Hefin	Male	Family farmer
Clare	Female	PhD student

This section will now offer more descriptive detail about each participant to build up a picture of each character. It is particularly concerned with exploring each character's relationships, occupations, hobbies, roles within the wider community, character and personality, and contributions to the study.

Llew

Llew is a full-time family farmer in his mid-40s. He has a 136 acre mixed farm with sheep, beef suckler cows, and some arable crops for silage and hay. He also works occasional days for the electricity board. In his spare time, Llew is very active in the local community. He is a governor for the local primary

school, a member of the coastguards and is a supporter of Plaid Cymru (the National Party of Wales). He also enjoys singing with the local choir and writing poetry. Llew is motivated by a great sense of pride in his livestock and farm, and works hard to ensure productivity and success in the future. He is also always ready with a cup of tea or some supper for friends and visitors, and keen to offer a helping hand whenever possible. Llew has a very relaxed and jovial character, but is not afraid to stand up for his opinions and beliefs. During fieldwork, Llew became the most active participant. He opened up his family's home to me as if it were my own, taught me key skills and tasks like caring for ewes or driving a quad-bike, and gave me the responsibility to feed and tend sheep and calves. He also gave up a lot of his time to pass on knowledge, discuss and debate issues integral to the study.

Bethan

Bethan is in her mid-40s and an assistant head teacher at a local secondary school where she teaches chemistry. Having been a pupil at the same school she now teaches at, Bethan is known for her commitment to teaching and leadership. Llew and Bethan have two teenage children named Angharad and Cerys. In her spare time, Bethan enjoys helping her children to participate in after-school activities, socialising with friends, participating in local shows and carnivals, and is very keen on fancy dress! Bethan feels that she takes a 'back seat' when it comes to the day-to-day farm work and activity. However, she strongly identifies with the family farm and the way of life associated with it. She also supports other family members during seasonal activities by, for example, cooking for sheep shearers and balers, and plucking the Christmas

turkeys. During fieldwork, Bethan and I often went on trips around the local community to complete tasks such as shopping and running errands. These trips were a good opportunity to discuss her upbringing on the farm and how things have changed, and to engage with the community and meet local people.

Dafydd

Dafydd is a semi-retired farmer in his mid-70s. He is the father of Bethan and the father-in-law of Llew. Despite retiring to live in a house separate from the farmhouse, Dafydd continues to help Llew with activities and jobs on the farm most days. He also works for a local contractor to complete tasks such as ploughing and raking on different family farms in the area. Dafydd also helps friends such as Aled (see below) with jobs like moving sheep to graze different areas of the fields, and by ensuring the sheep are fed and checked on when Aled is away competing at shows or on holiday. In his spare time, Dafydd enjoys watching farm-orientated television programmes on S4C such as 'Ffermio' and 'The Fferm Factor', listening to music, and visiting local market towns to go shopping with his wife Rhiannon. Dafydd has a very gentle character with an endearing tendency to easily worry or become anxious. This means that together with his years of farm experience, Dafydd is well-respected for his sincere support and guidance for local farmers. During fieldwork, I usually returned from the farm each evening to stay with Dafydd and Rhiannon until breakfast the next day, but we spent more time together at the weekends. During this time, Dafydd took great pleasure in

telling me stories about the way he used to run the farm, showing me maps and some vintage machinery that he has restored.

Rhiannon

Rhiannon is a semi-retired farmer's wife in her 70s. She is married to Dafydd, is the mother of Bethan and the mother-in-law of Llew. Rhiannon spends a lot of her time completing housework and cooking, visiting and caring for friends and relatives in the community, and helping to look after Angharad and Cerys. Rhiannon really enjoys spending her spare time gardening, seeing her grandchildren take part in choir concerts and Young Farmers Club shows, and going shopping or watching television with her husband. Rhiannon has an understated caring nature and enjoys a laugh and joke, but is very considered and not afraid to say exactly what she thinks. Whilst staying with Dafydd and Rhiannon during fieldwork, Rhiannon took on a very supportive, protective and encouraging role. She woke and made breakfast with me every morning (even at 4.15am when I was learning to milk cows), did my laundry, helped me to learn Welsh by leaving little notes that I had to translate, set aside a space in the conservatory for me to write or complete my fieldwork diary, and kept a watchful eye as I enthusiastically embraced manual farm work.

Aled

Aled is in his 50s and a family friend of Dafydd, Rhiannon, Llew and Bethan. He has worked as an agent for the National Farmers' Union for nearly 20 years. Aled devotes a lot of his spare time to breeding and selling charollais sheep, and competes with them at various agricultural shows such as the

Royal Welsh. Aled is also involved in the running of the local rugby club, enjoys going to animal marts and going on holidays with his family. Aled has a laid back personality and appreciates the 'quiet life', but is full of witty lines and banter. During fieldwork, I saw Aled most days as he stops off at Dafydd and Rhiannon's every day for a cup of tea on his way to work. Aled also introduced me to the sheep husbandry which is related to shows and competitions, by inviting me to observe, help to prepare, and lead his sheep in the ring at a local agricultural show. Together with Dafydd, we also went on day trips to see other livestock, purchase agricultural equipment and support local producers at agricultural, game and food shows.

Hefin

Hefin is a full-time dairy farmer in his 30s. He is a family friend of Llew and Bethan, but is well known throughout the local community. Hefin's farm is approximately 3 miles away from Llew and Bethan's farmhouse. Hefin is married to Megan and they have two children and a third on the way. Hefin is fully committed to improving continually the success and profitability of his dairy farming by embracing new techniques, technologies and approaches. He currently uses a block-calving system, which he recently introduced to the family farm. In his spare time, Hefin enjoys visiting other farms to learn about new methods and practices, going out for a drink with friends, hiking to support charitable causes, and going to the beach with his wife and children. Hefin is very laid back and enjoys a chat and some banter, but is serious about his commitment to efficiently and productively managing his dairy farm. During fieldwork, Hefin and Megan taught me how to milk cows, let me

observe the artificial insemination of cows, and encouraged me to help out with the daily milking routine. This gave me useful insights into dairy farming, the block-calving approach and some agricultural technologies. They also gave up their time to answer questions, discuss their approach and practice, and express opinions on issues related to the future of family farming.

Clare

Clare is in her late 20s and a full-time PhD student in agricultural geography at the University of Worcester. Her PhD study is an investigation into contemporary family farming, practices surrounding technologies, and how farmers learn and share knowledge to improve the success of their agricultural activity. Building on trends in agricultural geography, these aims and objectives demand conducting fieldwork following an ethnographic approach. This also draws on Clare's earlier academic study and experience carrying out research as part of a Masters in social anthropology. For this study, undertaking ethnography involved living and working with the participants described in this character list to learn, discuss and subjectively experience elements of family farming. Despite her lack of any farming experience, Clare was taught and involved in many different tasks and activities including feeding, checking and caring for livestock and thoroughly enjoyed life on a family farm. In her spare time during fieldwork, Clare enjoyed learning how to fish and speak Welsh, helping with cooking, walking along the coast, and going on day trips in the local area

CHAPTER 7: THE INTERNAL DYNAMICS OF FFERM YSGAWEN

This chapter is concerned with exploring the internal dynamics of Fferm Ysgawen. It presents the results that address the innermost dimensions of the conceptual framework relating to internal dynamics of the family farm.

Within this part of the conceptual framework there are three research elements. The first element is concerned with the daily activities and practices of the family farm. These have been explored using ethnography, which involved living and working on the family farm, and participant observation. The second element is focused on considering how these everyday practices are related to the structures and routines of the family farm. These have been identified primarily through semi-formal interviews, in the field and focused discussions. The third element analyses this material to identify the significance of the internal dynamics of the family farm to its survival. This chapter therefore creates an account of the family farm which balances rich ethnographic material on everyday practices and actions with identification and analysis of the 'building blocks' or binding structures (c.f. Evans, 2009). Consequently, this chapter addresses the gaps in empirical and conceptual knowledge within agricultural geography concerned with the theorisation of a contemporary family farm. It also addresses the overall study aim of providing insights into how the family farm has persisted throughout periods of agricultural change.

The chapter is structured into 4 sections. The first section discusses the backdrop of Fferm Ysgawen which involves its geographical location, politics, language and history. Sections 2-4 follow the elements of the internal dynamics, part of the conceptual framework just outlined. Section 2 discusses

the familial and business relationships between the members of Fferm Ysgawen. It also explores their motivations to work together to own, live and run the family farm. The third section details the seasonal events of the family farm. Finally, section four explores the daily routine of Fferm Ysgawen.

7.1 The background of Fferm Ysgawen

Fferm Ysgawen is located towards the south west of Ceredigion, approximately 5-7 miles from the coastal towns of New Quay and Aberaeron. It is a 55 hectare (136 acre) medium-sized farm, with some additional rented land towards Newquay. Fferm Ysgawen is a mixed farm with a range of livestock and crops, but has a specialisation in sheep. This reflects the farming type trend towards sheep farming in the area that was highlighted in chapter 5. The farm has approximately 200 breeding ewes, 10 rams, 50 beef suckler cows and some arable crops. The ewes and rams are used to produce lambs, which are mostly delivered to a local abattoir to be slaughtered for meat sold in a national supermarket. This suggests that the family farm may be subsumed by broader connections in the agri-food system (Whatmore *et al.*, 1987a&b). The arable crops are used to produce hay and winter silage for the farm. This was because the farm family considered this to be less expensive than buying in animal feed. Consequently, while the family farm uses external connections to process outputs, they do not utilise the same connections for inputs. Having offered a brief description of the family farm, the remainder of this section will explore elements of the context in which Fferm Ysgawen exists. This will contribute to the identification and analysis of the building blocks or underlying processes of the family farm.

These include 6.1.1 family farmland, 6.1.2 farm family history and 6.1.3 Welsh language and politics.

7.1.1 Family farmland

Element six of Gasson and Errington's (1993, p.18) definition of a farm family business states that 'the family lives on the farm'. This is true of the farm family at Fferm Ysgawen. This sub-section unpacks the implications of this by investigating how the farm family used, related and 'produced' the farmland upon which they live.

Fferm Ysgawen lies in a north-east to south-west direction across a hillside. The upper fields reach the top of the hill and face the full strength of the wind as it comes off the Irish sea. Trees have been planted to give livestock more protection against the elements. The lower fields are much more protected, but can be prone to waterlogging. This lower area of the farm also features a lake, which is currently used exclusively for the family's interests such as fishing, canoeing and socialising with friends in the summer. Llew is currently interested in putting yurts on the land surrounding the lake for use as tourist accommodation. The farm contains two properties: the main farmhouse and a separate house. For the remainder of this thesis, the main farmhouse will be called the 'home farm' and the separate house 'Ty Cynnes'. Situated around the home farm, there are 10 barns or sheds which are currently used for a variety of purposes including storing logs, lambing, and winter housing for cattle. There is also an outdoor chicken coop, which provides fresh eggs for the house. There is a total of 17 fields on the farm and they vary in size. The fields are used in an alternating fashion for grazing

cows and sheep, and planting stockfeed and hay. These fields will be returned to in due course.

The rented land is approximately four miles from Fferm Ysgawen, towards New Quay. Dafydd told me that this land has been rented for many years, and is now thought of as part of Fferm Ysgawen. There are two distinct areas of land, which are divided by a tarmacked road. The first area runs alongside a river and consists of fertile flood plain land which is sheltered by the surrounding river valley sides. During fieldwork, it was used for grazing sheep and cows, especially during the summer months. The second area rises up the valley side and consists of grassland and woodland. This area is used for grazing cows. The grazing cows were alternated between the two areas of land every few weeks to allow the grass to re-grow. This rented land also provides wood for the wood burners and fires at the two properties on Fferm Ysgawen.

The fields at Fferm Ysgawen are recognised by the family by their individual Welsh names. The names are constructed through reference to features such as the location, size or condition of each field. For example, the name 'Cae Ysgol' refers to the field next to the school, 'Cae Gwair' is the hay field and 'Waun Ganol' is the moor or meadow in the middle. It is unclear who named the fields, as the family said that the field names have been there "as far as we can remember". Although some researchers have considered the importance of naming farm animals (e.g. Rees, 1961), there has been little interest in the practice of naming elements of agricultural land such as individual fields. This is important to consider because this naming of fields is a clear illustration of the ways in which individuals perceive and conceptualise

landscape. Philo (2000) argues that interest in the ways in which individuals mentally map their environments, within a broader concern with the immaterial, has been very significant for geographers moving through the traditions of humanism, post-humanism and the cultural turn. For example, Matthews (1995; see also Matthews *et al.*, 1998; Matthews and Tucker, 2005) is concerned with children's understandings, perceptions and experiences of a range of geographical contexts. Within agricultural geography a few studies have collected farmers' perceptions of rural / farm land, usually in order to compare with those of other 'users' (such as stakeholders, 'naturalists' and other inhabitants of the countryside) (e.g. Natori & Chenoweth, 2008; Rogge *et al.*, 2007). However, others have been keen to highlight that individuals do not only perceive their environment, but are active in its *production* (e.g. Wylie, 2007; Ingold, 2000).

This assertion is particularly significant when considering farmers, for whom perceiving and producing the landscape through activities such as ploughing, moving animals to graze and sowing crops is an obvious and everyday reality. In the case of Fferm Ysgawen, these activities together with the knowledge and experience that surround them have been manifested in the names attributed to fields. More specifically, the activities and knowledge of family farming have been *embodied* in the farmland, and vice versa. This is a clear illustration of what Gray (1998, p.341) has described as a 'consubstantial relation between family and farm such that the distinct existence and form of both partake of or become united in a common substance'. Moreover, this relationship 'is transmitted over generations'.

Indeed, every member of the three-generation family at Fferm Ysgawen used the same field names.

However, in trying to analyse field naming at Fferm Ysgawen, there are a further three points to make. First, field names not only remain significant over time as farm family generations change, but also as the use of individual fields and the local environment change. For example, despite the school closing in 2010, the field next to it is still known as *Cae Ysgol* (field next to the school) and while *Cae Gwair* (hay field) may not always contain grass crop for making hay (i.e. it may lay fallow for a time), it retains the name. This further emphasises the resilient importance of the consubstantial interaction between farm and family that Gray (1998) describes. Second, despite this resilience, the naming of fields at Fferm Ysgawen does have an element of fluidity and flexibility. For example, during the amalgamation of fields in the post-war years, a single or new name was selected for the 'new' field. Moreover, as I found it a challenge to remember the Welsh names, the family also referred in English to other features which helped me to distinguish each field. The field called *Cae Isaf Cwnwc* (lower field) became known as "the field with the orange twine on the gate" and *Waun Fawr* (big moor) was "the field where you check and feed the ewes and lambs". This highlights that field naming (and the consubstantial embodiment of farm and land it represents) is in a constant state of flux according to the form of the farmland, farm-based activity and the individuals involved in the naming process. In addition, as a more methodological point, my involvement in field (re-)naming highlights my positionality within the farm family. Third, the combination of this long-standing yet contingent tradition of field naming indicates that the farm family is able to

maintain their relationship with the land. This suggests an embodied yearning for their name to stay on the land, which illustrates their survival and continuation.

7.1.2 Farm family history

The fifth element of Gasson and Errington's (1993, p.18) definition states that 'Business ownership and managerial control are transferred between the generations with the passage of time'. Fferm Ysgawen has been in the same family for five generations. The transfer of the farm between these generations has led to a deeply ingrained sense of family legacy, tradition and way of life that is highly respected. To illustrate, Bethan took pride in telling me that her children (Angharad and Cerys) are the fifth generation on the farm. There is hope that Angharad's current interest in farming and her almost constant presence 'out on the farm' after school and during the holidays, will develop into her farming Fferm Ysgawen full-time. Geographers such as Riley (2009) have emphasised the importance of children's work which is the result of their parent's concerns with succession and survival of the family farm (see also Price & Evans, 2005). However, although there is this desire to maintain Fferm Ysgawen and its familial heritage into the future, the farm is a fluid entity and has undergone significant change over the years. While looking at some maps of the farm with Dafydd, he told me of the substantial changes that were made across the farm during the post-war years. For example, during this time, 28 fields were amalgamated to make 10 fields. With the help of grants, the condition of some of the fields was also improved by putting in new drainage channels and ditches.

Other changes have occurred as Fferm Ysgawen has been succeeded by the following generation. The importance of change over time on family farms has been emphasised by agricultural geographers such as Riley (2010) and Price and Evans (2005), who have argued for the use of qualitative methods such as ethnography and the collection of life histories to capture this. The current owners, Llew and Bethan succeeded the role of owner of Fferm Ysgawen from Dafydd and Bethan who took semi-retirement. At the time of succession, Llew and Bethan changed Fferm Ysgawen as a dairy farm to a mixed farm with a specialism in sheep. An agricultural economy perspective might presume that this change was because Fferm Ysgawen was not sufficiently profitable to continue as a dairy farm. However, further investigation revealed this was a key turning point for the farm family. Llew and Bethan described how Dafydd's health took a worrying turn partly due to the heavy demands of the dairy farm, and it was a relief to see him improve once this change took place. During fieldwork, Llew and Bethan undertook some major building and refurbishment work in the farmhouse, and this provided an opportunity to talk about the changes that other generations have made. For example, when Dafydd and Rhiannon succeeded the farm from Dafydd's parents, they removed several dividing walls in the farmhouse, converted it into a bed and breakfast, and started a fly fishing enterprise.

Price (2004, p.180) states that passing control of a family farm to an heir affirms a sense of family historicity, belonging and identification with farmland that is important to family farmers. However, this transfer of control leads many retiring farmers to fear a sense of lost identity and purpose. Price (2004) writes that some farmers worry about not being needed on the farm,

marginalisation in decision-making processes, and losing the 'label' of being a farmer. Although Llew and Bethan have taken primary control of Fferm Ysgawen following succession, Dafydd and Rhiannon have retained significant roles in the running of the farm. For example, Dafydd visits the farm every day to "see what needs doing", often before carrying out several hours of farm work. He is also still involved in the decisions that surround making changes on the farm. To illustrate, when Llew arranged to visit a farm to see a bull with the view to purchasing it, he asked a few people to accompany and help him, including Dafydd. For Dafydd, retaining this level of involvement on the family farm after succession is related to three factors. First, reflective of Price's (2004) observations, Dafydd finds it difficult to see himself outside of farming without the self-identifying 'label' of 'a farmer'. This became clear when we both attended an event and Dafydd was asked, "do you farm?". He replied with "yes", before leaving a pause and adding "well, retired now".

Second, the daily routine that is integral to family farming, has been physically and mentally embodied within Dafydd to such an extent that it is difficult to re-adjust. For example, he still wakes before 7am and finds it difficult to imagine 'having a lie in' rather than doing work on the farm. Third, Dafydd is still deeply concerned and sometimes anxious about work, events and change at the family farm. It would be fair to say that sometimes, he finds it difficult to 'let go' (Riley, 2011). One evening in late summer, Llew and I decided to continue working into the evening to bring the recently baled hay back to the home farm. To do this, I agreed to drive 'the kramer', which is a piece of farm machinery used for handling and loading farm material, along the road to pick up the bales from a field across the farm. When we had finished the job, I

returned to Ty Cynnes where Dafydd exclaimed, “I saw you driving along the road! I thought it was Angharad at first, but when I looked through the binoculars I saw it was Clare!! You drive fast too! Good!”. Even though Dafydd did not have a physical role in this farm activity, he became involved by observing and encouraging me ‘helping out’. These factors illustrate Price’s description of the fears that many semi-retired / retired family farmers have. However, Dafydd’s experiences indicate that while succession may mean ‘slowing down’ and observing rather than participating in some farm work, there are many ways of retaining involvement in the family farm. Retired farmers may be a source of essential advice and guidance, be reliable and enthusiastic workers, and provide encouragement for those learning how to farm.

7.1.3 Welsh language and politics

Chapter 5 discussed the significance of the Welsh language in Ceredigion, and highlighted that just over 50% of the population speak, write and read in Welsh. At Fferm Ysgawen, all members of the family conversed purely in Welsh. Llew told me “that’s [Welsh] what we speak every day, at home, around the table”. Speaking and hearing Welsh was related to personal identity (i.e. of ‘being Welsh’), the home (especially the kitchen table) and local community. In addition, the family enjoyed watching Welsh-language programmes such as *Pobl y Cwm* on the national television channel, S4C. Outside the family, apart from myself and two other individuals (a saleswoman working for a vacuum cleaner manufacturer and an amateur archaeologist from Bristol asking for permission to use his metal detector on the farmland),

everyone who visited the farm whilst I was present during fieldwork spoke in Welsh. However, writing and reading Welsh was much less significant for some members of the family. For example, Dafydd told me how he was much “happier” speaking in Welsh than English, but didn't like to read in Welsh at all. As a result, he read publications such as the local newspaper, *Gwlad* (the publication distributed to farmers by the Welsh Government) and forms issued by agricultural concerns in English. He said that this was because the form and meaning of words used in spoken and written Welsh are often very different: “The words [in written Welsh] are too deep” (Dafydd).

As a result of the significance of spoken Welsh at Fferm Ysgawen, I was encouraged to expand my limited knowledge gained at school to a standard that allowed me to understand and speak the language. Llew was particularly supportive. He introduced me to a local evening class, checked my homework and frequently asked “Are you keeping up the Welsh?”. My enthusiasm to learn and gradual proficiency in Welsh was important during fieldwork for three reasons. First, I was able to understand and contribute to daily chat and discussion, which enhanced the level to which I was become embedded in the day-to-day life of Fferm Ysgawen. Second, some discussions were particularly informative for the study, and being able to understand them enabled me to collect research material. Third, some people 'warmed' to me through my attempt to learn and speak Welsh, and its connection to my Welsh accent and upbringing. I imagine that this is because it fostered a sense of familiarity and indicated my desire to become part of the local culture and community. In part, this enabled me to collect and enhance the material collected for the study.

Llew's enthusiasm for promoting and encouraging learners of the Welsh language is partly connected to a commitment to the national political party of Wales, Plaid Cymru. While other members of the family expressed opinions that could be related to the politics of Plaid Cymru, Llew indicated the most vehement support for the party. To illustrate this difference within the family, when visiting Hefin and Megan one day, Hefin tried to play a prank and told me to return to Fferm Ysgawen and suggest that "Llew supports Labour". Smiling, I refused, but this sparked a discussion where Megan said "[Bethan] is a bit like me, she'll vote for someone if she likes them and thinks they'll do a good job, but [Llew] is Plaid through and through". Llew is a particularly keen supporter of Plaid Cymru's stance on issues such as the prevention of bovine TB, the Welsh language and the devolved Government (and the possibility of Welsh independence) (see Plaid, nd.). In terms of the agricultural sector, Plaid Cymru is also a great supporter of the Glastir agri-environmental scheme, local food networks and farmers' markets, and sustainable products / technologies that alleviate the effects of carbon, climate change and greenhouse gas emissions (Plaid, nd.). Plaid Cymru is also committed to maintaining restrictions on the cultivation of GM crops in Wales (Plaid, nd.). As will be discussed in due course, Llew is predominantly motivated by producing food, is interested in the present and future use of GM (see Chapter 2), and the vast majority of his agricultural outputs enter the UK agri-food system. Therefore, although Llew supports some of Plaid Cymru's manifesto, it is unclear how the party's stance on agri-environmental conservation, genetically modified crops and local food networks feeds into the activities and practices at Fferm Ysgawen. As a result, the broad ethos of

the party (the promotion and preservation of Welsh culture) outweighed individual policies, even when they related to farming practice.

A significant amount of literature and research within agricultural geography is concerned with assessing the impact and success of new agricultural policies on farmers. For example, Morris and Potter (1995), McEachern (1992), Burton and Paragahawewa (2011), and Hanley *et al.* (1999) evaluate the uptake and effect of agri-environmental schemes on farmers. However, there has been no significant attempt to consider the role of the politics of farmers themselves on their farming practice. This subsection has used material collected from Fferm Ysgawen to highlight the importance of cultural phenomena such as the Welsh language, culture and politics.

7.2 Farm family relationships and motivations

Chapter 6 gave some information on the farm family members at Fferm Ysgawen. This section explores how the family farm members work together to fulfil shared motivations and aspirations for the farm. This section considers how these relationships are manifest in the land, properties and production of the family farm.

7.2.1 Farm family relationships

Four elements of Gasson and Errington's (1993) definition highlight the roles, relationships and hierarchy of the farm family business. The first element states that 'business ownership is combined with managerial control in the hands of business principals' (Gasson & Errington, 1993, p.18). Element two

refers to the relation 'by kinship or marriage' between these business principals (Gasson & Errington, 1993, p.18). The third element describes how 'family members (including these business principals) provide capital to the business' (Gasson & Errington, 1993, p.18). Finally, element four stipulates that 'family members including business principals do farm work'. These four elements and further explanation by Gasson and Errington (1993) suggest that the business principals are the 'heads' or 'managers' of the farm family business as they allocate resources, undertake farm work, and delegate activities and jobs to other family members. This sub-section considers how significant these elements are at Fferm Ysgawen.

The genealogy provided as part of the Character List (Chapter 6) illustrates that all members of Fferm Ysgawen are related by kinship or marriage, which confirms the importance of the second element of Gasson and Errington's (1993) definition. Llew and Bethan may be recognised as the 'business principals' of the farm. Price (2004) describes how the 'status' of family farmers may be defined by which property they inhabit on the family farm. Before succession, Llew, Bethan, Angharad and Cerys used to live in Ty Cynnes, and Dafydd and Rhiannon in the home farm. On succeeding the farm, they swapped around. Alongside this move, the roles of the family members have changed. Llew is the primary decision-maker, labourer and manager of farm resources. However, during fieldwork, I observed and understood how each family member had distinct roles and jobs that contributed to the running of the farm. For example, Llew and Bethan described how they worked off the farm to keep it going. So, consequently, Bethan's full-time employment as an assistant headteacher directly

contributes to the survival of the family farm. In addition, Dafydd and Rhiannon each spend some time at the farm every day to complete farm work, look after the children before and after school, and help with household chores. Moreover, these roles and activities were usually not delegated or requested by Llew. To illustrate, I was amazed at how Angharad and Cerys do not need to be asked to do jobs like check on animals, wash the dishes or clear away the kitchen table. As a result, in contrast to Gasson and Errington's (1993) perception of the 'business principals' at the 'head' of the farm family, it could be argued that at Fferm Ysgawen every family member contributes in a way that is indispensable. Rather than a hierarchical arrangement which involves delegation by a 'principal', individuals' roles may be conceptualised like cogs which keep a machine running. If one individual failed to uphold their role, the whole farm family would fail to run smoothly.

7.2.2 Farm family motivations and aspirations

Gasson and Errington's (1993) definition does not give any consideration to the concerns or aspirations of family farmers. However, literature in agricultural geography that explores elements of farm change associated with phases that occurred after post-war productivism, such as 'post-productivism' and multifunctionality, has argued that their lack of uptake is due to little affinity with the motivations of farmers. For example, farmers' lack of interest in agri-environmental schemes and diversification activities has been related to their desire and ethos to produce food (Evans *et al.*, 2002; Burton, 2004). This indicates the importance of farmers' motivations and justifies exploring them as part of work that seeks to define the family farm. Consequently, this

sub-section will detail the central motivations and aspirations that emerged during fieldwork at Fferm Ysgawen: productivism, way of life and aspirations.

i) Productivism

The ability to produce food from the land at Fferm Ysgawen was a key motivation behind farming activity (Evans, 2009). Llew had great pride in his crops and livestock, and took a lot of pleasure from watching them grow and develop into agricultural 'products'. For example, when we went down to the rented land to check on the cows, his pride was clear as he sat down on the grass to point out their shiny coats, docile characters and grouping as a herd. This pride became even more pronounced when we discussed the cows as "beef stock" that provided good quality meat. Meat from the farm was also frequently eaten for *swper* (supper in English). During the period of fieldwork, three sheep were slaughtered for home consumption during fieldwork), which asserted the connection between animals, meat and productivity at the farm. Llew even joked by playing on buzzwords within recent 'quality food' discourse (see Ilbery & Maye 2005; Watts, Ilbery & Maye, 2005): "you can't get any more *local* than this!".

In addition to using the land to produce, there was an appreciation for the wildlife and aesthetic features on the farm and in the surrounding area. For example, Llew enjoyed relaxing by fishing on the lake and "seeing the birds of prey" due to their connection to the Welsh rural landscape. However, both Dafydd and Llew condemned agri-environmental schemes. They told me that "farming is about producing food" and "the condition [of the land] goes when it's not farmed" (Llew, Dafydd). They were also aware of the increased

inspections and form-filling that may be related to engagement in these schemes. Therefore, it may be observed that Llew and Dafydd feel that producing food is the primary aim of farmland. Moreover, agri-environmental schemes were perceived as another layer of bureaucracy which challenges the independence of farming families (Pile, 1990) (not even 'passive adopters' on Morris and Potter's (1995) spectrum). However, appreciating wildlife and maintaining the condition of the land was seen as part of their (productive) farming activity. This reflects Falconer's (2000) argument that some farmers like conservation, but dislike formal agri-environmental schemes. As a result, it may be argued that motivations to produce and conserve are not mutually exclusive.

This offers a new way of thinking about the relationship between productivism and conservation, and how they can co-exist within the context of a family farm. This co-existence is not based on the introduction of designated conservation policy in the form of an agri-environmental scheme, but on the ethos and concerns of the family farmers themselves. There is, therefore, significant scope and justification for the inclusion of farmers perspectives, opinions and practices to be included in debates regarding the introduction of a neo-productivist phase of agriculture.

ii) Way of life

Maintaining Fferm Ysgawen and the way of life enjoyed by its family members was a central motivation. This motivation was seen as distinctive from other family farmers' lives that are more motivated by financial gain or agricultural success, and are therefore more industrialised and better equipped with

technology. This indicates the perception of multiple contrasting farming lives. In contrast, when I enquired about the role of technology at Fferm Ysgawen, Llew replied,

“there isn't much technology here, we're not really industrialised enough'. This led Bethan to follow this up by saying, 'it's a way of life here really [...] we work off the farm to keep it going”.

Maintaining the farm for its way of life was significant to the family in three key ways. First, the family farming way of life was considered a good environment in which to live, work and maintain for the future. Family members appreciated being able to work outdoors, independently, and to their own routine. Second, the way of life is an integral part of the heritage of the whole family and its individual members. As Bethan said, “it's a way of life here really [...] we [...] keep it going”. In addition, despite being retired, Dafydd came to the farmhouse every day to “see what needs doing” (Dafydd). Farming was not simply a 'job' from which he 'retired' but an integral part of his self identity, sense of well being and way of life (Riley, 2009, 2011; Price & Evans, 2005; Price 2000. Third, the way of life was considered to be ideal for bringing up children. Living in the countryside, helping with farm and house work (e.g. tending for farm animals, making tea), and becoming familiar with machinery is thought to be good for children growing up. Bethan looks back with particular fondness at her girls' childhood on the farm: “I used to put Angharad in an 'all-in-one suit like this [showed me a similar suit] to go out farming [...] her head barely reached the top of this [the kitchen] table”. This work

reinforces the arguments of agricultural geographers such as Pile (1990), Price (2000), Riley (2010) and Bennett (2005b) who all emphasise the significance of the farming way of life.

iii) Aspirations

Llew and Bethan have two significant aspirations for the future of Fferm Ysgawen. First, they would like to increase the stock of beef cows. Although Fferm Ysgawen is a mixed farm which specialises in sheep, Llew is currently working on building up the beef stock and hopes this will continue in the future. During fieldwork, this plan was beginning to be realised through the purchase of a bull from another farm and the weaning of male dairy calves from Hefin and Megan's farm.

Second, both Llew and Bethan discussed the possibility of their daughters succeeding the farm in some depth. This was embedded in farm changes that were completed as preparation for this eventuality. For example, during fieldwork, Llew began to plan to build more barns and sheds to provide more sheltered space and make it easier to move livestock around. When discussing these changes, he told me, "I'm a big believer in spending money to make things easier, especially for the girls".

These actions were related to ambitions which were embedded within each of the member of the farm family. For example, while Llew and Bethan encouraged Angharad and Megan to work hard at school and engage in a range of after-school activities, some of their interests were considered more indicative of a desire to farm than others. For example, Angharad was particularly enthusiastic and self-motivated to work on the farm. For example,

each day she would dash into the farmhouse after school to get changed and help with farm chores, showing disappointment if there was no 'farm work' for her to do (Riley, 2010). Llew also described how she had a "clear instinct" with the animals and could "sense" when something wasn't right. This quality, which is very difficult to define, was seen as a pre-requisite for a good farmer. In contrast, Megan revelled in after-school activities which involved Welsh traditions such as singing in the choir, acting, dancing and participations in shows such as the Eisteddfod. These observations fed into discussions about Angharad's future career and the possibility of farming: "Angharad is so going to be a farmer" (Bethan) (Price & Evans, 2005). However, Bethan did also tell me that sometimes children, who are really keen to farm as youngsters, change their minds when they get older. As such, Llew and Bethan did keep open minds regarding plans for future succession. Angharad and Bethan themselves were aware of an ingrained or pre-destined role in succeeding the family farm. Aside from the opinions and observations of their own family, they told me how children at their school made a clear distinction between those who lived on family farms and those who didn't. The term "ham bones" was used for children from a farm and "townies" for those who were not. Like many labels and nicknames attributed to children at school, these were considered routine. From what I understood from Angharad, these terms were more likely to be used for children not from farms to mark out those who were. Angharad shrugged her shoulders as she said "that's just what they call us". This indicates that the family farm was not only the children's home, but central to their hobbies, identity and options for the future. Moreover, even more than

this, there existed a deeply embedded yearning within each family member to keep the farm going.

7.3 Seasonal Activities and Annual Events

Gasson and Errington's (1993) definition asserts that family farm members manage and complete farm work, but it does not explain the nature of farm work or how it is organised. However, subsequent work in agricultural geography discusses how the activities and practices on farms are often categorised into seasons that make up an annual calendar. For example, Williams' (1967) book on farming in the Midlands is structured into chapters that focus on the seasonal time periods of 'After Harvest', 'Winter Work', 'Awaiting Spring', 'Spring', 'Spring Work' and 'The Midland Summer'. Haines (1982) offers a more detailed account of the annual activity on a mixed hill farm, which he suggests are split into two monthly and even single monthly blocks. For example, activities undertaken during the months of May and June include moving ewes with single lambs to the mountain and all other ewes (and their twins / triplets) plus cattle to the 'improved hill' while in-bye land (relatively level land at the bottom of a valley) is 'closed up for hay / silage' (Haines, 1982, p.144). The reasons behind organising farm work into seasons vary, but some farming types appear to be better suited to this form of division than others. For example, in sheep farming, moving ewes and lambs to graze in May and June makes the best of peak grass growth that occurs during these months (King, 1978). Similarly, some dairy farmers have spring-calving herds because 'their demand for grass is very similar to the grass growth curve' (Haines, 1982, p.104). However, Haines (1982) suggests that even

farming types that don't appear to lend themselves to seasonality often retain this division of farm activity. One example is the continuous all-year-round sowing of spring / winter sown crops such as wheat or barley. Haines (1982) describes that for winter-sown crops, late August to winter is the time for preparing the ground and seeding, spring is spent rolling (compressing) the field and applying agri-chemicals to prevent pests and disease, and late summer is for harvesting and storing the grain. Moreover, even if a spring variety of wheat is grown (if, for example, the winter variety fails), Haines (1982, p.81) states that this seasonal arrangement of tasks remains, with the tasks 'telescoped into a shorter period' to retain a late summer harvest.

In addition to seasons, agricultural shows and events are important dates in the calendar. Duncan (2004) writes that they provide an opportunity for farmers to have a break from farm work, show or compete with their livestock and other agricultural products, meet up with friends, and see the work of other farmers. This literature suggests that seasons and annual events such as agricultural shows provide an important way of organising the tasks and activities associated with different types of farming. As a result, it could be considered that planning activities according to seasons and attending annual events is an important dynamic of family farming. Consequently, this section will assess this possibility by considering the significance of seasonal activities and annual events at Fferm Ysgawen. It will be split into 2 sub-sections. The first section will present and explore an annual calendar showing how the work related to sheep farming is divided. Work related to sheep farming has been selected because its specialisation at Fferm Ysgawen means that it is often prioritised over other forms, which

results in a particularly clear picture of seasonal organisation. The second section will look at attendance and participation at annual agricultural shows, and question their importance and meaning for the farm family members.

7.3.1 Sheep

The routine of sheep farming is intense. When discussing the amount of effort involved across farming types, I described to Dafydd finding sheep “high maintenance” while he laughed and said “with sheep, there's something to do every day” Nevertheless, perhaps more than any other farming type, sheep farming follows a distinct annual routine as each season is marked by particular events. Spring sees the birth of new lambs, their rapid growth and journey to market or slaughterhouse. Summer is spent vaccinating or 'dosing', protecting the sheep against infections such as foot rot, and shearing. This was described as giving the sheep “a once over” (Llew) or “like an MOT” (Dafydd). Autumn is the time for breeding, scanning for pregnancy and ensuring expectant ewes have enough nutrition. Winter is spent grazing the sheep and checking on them regularly, especially during harsh weather. The following gantt charts (Figures 16, 17, 18) offer a detailed portrayal of the complexity of the seasonal routine of sheep farming.

Figure 16: Annual routine of sheep farming: ewes

Type of Sheep	Task / Event	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Ewes	Ewes brought in for shelter ready for lambing	✓											
	Ewes give birth		✓	✓									
	Ewes suckle lambs		✓	✓									
	Ewes without offspring and lambs without mothers are 'matched up' or bottle-fed		✓	✓									
	Ewes are turned out (with their lambs). Grazing.		✓	✓	✓	✓							
	Feet clipping						✓						
	Dosing						✓						
	Ewes selected for home slaughter and consumption						✓						
	Shearing							✓	✓				
	Rams introduced to ewes									✓			
	Scanning										✓		
	Ewes separated into 'singles', 'doubles' and 'triples'										✓		
	Ewes pregnant with triplets given supplementary feed										✓	✓	✓
	Outdoor grazing				✓	✓	✓	✓	✓	✓	✓	✓	✓

Figure 17: Annual routine of sheep farming: rams

Type of Sheep	Task / Event	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Rams	Rams introduced to ewes									✓			
	Feet clipping						✓						
	Dosing						✓						
	Rams selected for home slaughter and consumption						✓						
	Outdoor grazing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Figure 18: Annual routine of sheep farming: lambs

Type of Sheep	Task / Event	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Lambs	Birth		✓	✓									
	Suckle		✓	✓									
	Weaned and fed up			✓	✓	✓	✓						
	Dosing						✓						
	Weighing				✓	✓	✓						
	Lambs selected for breeding ewes					✓	✓						
	Lambs sent to slaughter / market				✓	✓	✓						

Having described the seasonal routine, it is now appropriate to focus on one season to explore some key events and activities in more depth. Spring may be considered as the pinnacle of all the seasons, as the success of lambs at the market or slaughterhouse reveals the results of the effort put in across the whole year. However, for reasons that will become clear, while the routine of other seasons was considered 'regular' or "the same every year", spring was seen as full of unpredictability: highs and lows. Llew described this season as one of the "most revealing times" in the farming calendar: "then you see what it's really like". As a result, the remainder of this section will focus on describing this season. Spring activities may be split into four sections: i) lambing, ii) feeding up, iii) breeding and iii) finishing.

i) Lambing: Llew described lambing as "work around the clock" as he attempts to predict impending births, assists ewes struggling during birth, and checks the health of the newborns before encouraging them to suckle. Unfortunately, a small minority of lambs are born stillborn, or die during birth. The death of lambs is considered "depressing" and a time of "low morale" (Llew). Other lambs may be born too small to manage on milk suckled naturally and must be bottle-fed. These lambs continue to be reared by hand, usually by Angharad and Cerys, and are known as "pet lambs". Some ewes also fail to bond with their offspring and kick them to stop them suckling. Llew said, "that's what really gets me down, when the mothers don't love their lambs". Attempts are made to bond these lambs with other ewes, who sometimes accept them as their own. Ewes and their newborn lambs are kept inside for the first few days before they are turned out into the fields.

ii) Feeding up: Once the lambs are considered strong enough to leave the barn, they are moved to a field with the ewes. They are checked each day and fed with a combination of unmilled oats and barley. It was often my role to feed the lambs by filling a sack with this mix, taking it to the field on the quad bike and placing it in a feeder. The feeder was fitted with a guard to stop the ewes from accessing the food, thereby allowing the lambs exclusive access.

iii) Breeding: Some lambs are selected to become breeding ewes. Selection was usually based on visual appearance, gait and the estimated amount of meat the lamb would produce (see below for how to estimate the amount of meat). Llew looked for potential breeding ewes that were relatively tall and rounded, with long and narrow faces, and even colouring. Their legs had to be straight and strong, which gave a solid, confident gait. The ability to identify a lamb which would develop into a good breeding ewe is learnt from past generations (e.g. Llew learnt from Dafydd). However, cultural ideas and individual preferences of 'good', 'pedigree' or 'strong' mean that this becomes embedded and ingrained (Grasseni, 2004).

iiii) Finishing: Lambs are guided through the race to be weighed every week until they reach the benchmark of 36 kg, which produces about 18kg deadweight. If they did not reach this weight, they were returned to the field to put on more weight. If they did, they were considered 'ready', would be sprayed with a paint mark and separated. Another way of 'testing' to see if lambs were ready was to look for horizontal rippling in the fleece on the side

of the lamb. This was said to indicate a layer of fat underneath the skin. Any more weight gain would add too much fat, and “fatty lambs” (Dafydd) are:

“no good. They are down-graded at the abattoir, so we don’t get so much money. To be honest, sometimes I think they [members of staff at the abattoir] down-grade unfairly because they mix up the lambs, but that’s just my opinion” (Llew & Dafydd).

During fieldwork, most lambs were taken to the local slaughterhouse, but some were also taken to Cardigan mart (see Chapter 9). Seeing good quality lambs leave the farm brought appreciated income and satisfied the productive motivations of the family, which led to a great high.

7.3.2 Shows and events

During fieldwork, I attended or discussed agricultural or country shows and events with participants. These events provided an opportunity for farmers to compete with their animals (Holloway, 2004, 2005), sell pedigree livestock, purchase equipment and socialise with fellows.

In my first month of fieldwork, I was invited to help some family friends of Llew and Bethan run a stall at The Royal Welsh Smallholder and Garden Festival. Held on the 21st and 22nd May, 2011, this show is about promoting small scale agriculture, horticulture, and gardening. The stall on which I helped was run on behalf of a society which aims to increase the awareness and conservation of ancient Welsh cattle breeds. These breeds are recognised by their solid, belted or line-backed coloured patterning of white,

red, blue or grey. To uphold its aims, the society aims to highlight the history of Welsh agriculture and the significance of these cattle breeds, register cattle in order to record and conserve their colour variations, and create a market for their meat. As part of this activity, the stall was made up of informative display boards and a video, publications and promotional items for sale, and a pen with a cow and calf. Customers and farmers could also order meat, give their contact details to become involved in keeping the cattle, and apply to register their cattle. Alongside members of the society, my role was to meet and greet visitors to the stall, answer questions, and promote some of the items on sale. The work of the society to promote the preservation of rare breeds, including through the purchase and consumption of their meat, reflects the work of The Rare Breeds Survival Trust (RBST) (Evans & Yarwood, 2000). However, the central difference between this society and the RBST, was the inclusion of the rare breeds in a particular representation of Welsh 'agri-culture'. This provides further evidence of the role of Welsh culture and politics in the presentation of farming practice and vice versa (Holloway, 2004).

7.4 The daily routine of Fferm Ysgawen

Gasson and Errington's (1993) definition details that farm work is organised and completed by family farm members, but does not explore the process by which this is achieved. Moreover, the definition does not refer to activities that occur in addition to farm work, which contribute to the social or home life of the family farm. Bennett's (2005b) account of a scene centred on the kitchen table on a family farm provides rich insights into the routine of breakfast. This snapshot of a single routine everyday activity reveals complex relationships

between family members, how work is structured and assigned, and the role of the researcher. However, aside from this example, the daily routine of farming families is largely underplayed within literature in agricultural geography. Yet my time at Fferm Ysgawen was filled with activities like this as the farm seemed to run on a pre-set routine that changed very little. Llew laughed as a visitor drove up the drive just in time for afternoon tea, saying of the farm: “it runs like clockwork”. This is because roles and tasks become ordinary, regular and assumed, which means that they are easily recognised and understood by others. This means that the effort and energy that would be spent allocating and organising these tasks can be invested elsewhere on the farm. This makes the farm family resilient. Consequently, expanding Bennett's (2005b) consideration of a single routine activity to explore the whole daily routine will offer an important perspective on the internal dynamics of the family farm.

The following table (Figure 19) provides an outline of the daily routine at Fferm Ysgawen, which is taken from an entry in my fieldwork diary made in early June, at Fferm Ysgawen:

Figure 19: The daily routine of the family farm

Time	Activity	Participants involved
7.00 – 8.00	Get up, have breakfast	Dafydd, Rhiannon, Clare
7.10	Aled joins for a cup of tea with us on his way to work	Aled, Rhiannon, Dafydd, Clare
8.00	Go to farmhouse	Clare
8.05	Llew leaves to work with the Electricity Board	Llew
8.10	Angharad leaves to catch the school bus	Angharad
8.25	Walk with Cerys to wait for her school bus	Cerys, Clare
8.35	Return to farm	Clare
8.35 – 8.50	Wash the breakfast dishes	Clare
8.50 – 8.55	Put wellies and oilskins on	Clare
9.00 – 11.30	<ol style="list-style-type: none"> 1. Pick up the quad bike from the shed and some empty sacks. 2. Drive into the feed shed, fill two sacks with unmilled grain and balance on the quad bike. 3. Drive to the field with the ewes and lambs and put the grain in the feeder. 4. Drive around to check on all the sheep. Note anything unusual to report back to the family. 5. Repeat steps 3-5 in the field across the river. 6. Pick up two bales of hay and take to shed holding the calves. 7. Cut the twine on the bales with your penknife, break apart the hay with your hands and spread all over the shed. Watch that the calves don't escape when you open the gate, and beware of them kicking the fresh hay about. 8. Feed the calves with 1 small tub of unmilled grain and 1 large tub of pellets. Make sure to put the grain in the feeder before the pellets. 9. Spend some time looking at all the calves and note anything unusual (e.g. any that are a little quiet or slow, or move awkwardly). 	Clare
11.30	Return to the farmhouse for a cup of coffee. Complete fieldwork diary or catch up with thesis writing.	Clare
11.55-12.45	Rhiannon rings to tell me to come up for some lunch at 12.00. Go straight up to Dafydd and Rhiannon's house. Have dinner. We watch the BBC programme Bargain Hunt. I help to wash and put away the dishes.	Rhiannon, Clare
12.45	Return to the farm to complete my fieldwork diary.	Clare
14.00	Llew returns home from work.	Llew
14.00 - 14.20	Chat to catch up and say how the morning has gone.	Llew, Clare
14.35	Llew and I go to check on the cows on the	Llew, Clare

	rented land. On the way back we stop off to get some cattle pellets at the local merchants. We have a chat with the owner.	
15.35	Return to the farm.	Llew, Clare
15.40	Angharad returns home from school.	Angharad
15.45	Cerys returns home from school	Cerys
15.45	Tea	Llew, Angharad, Cerys, Clare
16.00	Cerys is picked up for an after-school activity	Cerys
16.15 - 16.45	Afternoon feeding. Feed the beef sucklers.	Llew, Angharad, Clare
16.45	Help Angharad with her geography homework	Angharad, Clare
17.10	Cerys returns from her after-school activity	Cerys
17.15	Llew begins to make supper. I offer to help peel the potatoes, but he says to sit down. We have a general chat.	Llew, Clare
18.00	Bethan returns home from work	Bethan
18.00 - 18.30	We all chat about how our days have been.	Llew, Bethan, Angharad, Cerys, Clare
18.30	We all sit down for supper	Llew, Bethan, Angharad, Cerys, Clare
19.15	Wash dishes, tidy up and help Cerys with her homework	Bethan, Angharad, Cerys, Clare
20.00	We all watch Pobl y Cwm (a soap opera) on S4C (a Welsh television channel)	Llew, Bethan, Angharad, Cerys, Clare
20.45	Return to Dafydd and Rhiannon's	Clare
20.55	Have a cup of tea and catch up with Dafydd and Rhiannon. We all read the daily newspapers and watch some television.	Dafydd, Rhiannon, Clare
22.00	I leave Dafydd and Rhiannon to have a shower and go to bed.	Clare

This outline of the daily routine provides an insight into the activities that constitute the running of the family farm. Together with the seasonal tasks and events, this provides a detailed account of the nature of farm work and how it is organised. The outline also highlights other activities that occurred alongside work, but which were equally integral to the family farm. These include chores such as cooking, housework and the completion of homework by the children. Other activities on the farm included taking breaks to chat, share meals and entertain friends. These social activities were very important to the family farm, as it reflected their motivation to maintain a good way of

life. As such, the following sub-sections will explore household chores and social activities to offer key insights into the cultural life of the family farm.

7.4.1 Chores and errands

Alongside farm work at Fferm Ysgawen, there were chores and errands that were completed, often on a daily or weekly basis. The two main chores were cooking the evening meal, which was known as *swper* and cleaning the house. Supper was prepared and cooked by various members of the family. At the main farmhouse, Llew would cook most of the weekday suppers, as Bethan was often still at work. Llew said, “Bethan gets up earlier than me in the week [...] it’s more than a job to her”, “so it’s good that I’m around the farm, because I can get the dinner on”. I would offer to help and was often told “sit down, have a rest”, but at other times I enjoyed making meals, which contributed to my increasing embeddedness within the family and their banter. To illustrate, when talking with Llew’s mother, it was often whilst stirring some soup or making a curry and when I phoned once from a supermarket to ask if there was anything I could get, Llew replied, “Yes! Some of that rice and you can make me a risotto!”. On the weekends, Bethan would often take over from Llew to cook the meals. The family also enjoyed going out for meals at restaurants in the local area (the local steakhouse was a favourite) or getting a take away as a ‘treat’, usually during the school holidays or for someone’s birthday. Some of the cleaning was completed by a cleaner who came to the house for several hours a week. Bethan also swept the floors, tidied and cleaned the kitchen, and did the laundry. The children also helped to keep their rooms tidy, wash up and clear away the table after meals.

Other errands included food shopping, going to the bank and Post Office, and picking up the newspaper. We went food shopping to a supermarket in Cardigan usually every week. Between these trips, I would sometimes be asked to go to the local shop (which was attached to a petrol station) to pick up “just a few things” (Bethan). Trips to the bank or Post Office were usually undertaken alongside doing other tasks like food shopping or going to the store for animal feed. I was sometimes asked to jump out of the car to drop a letter into the post box on our way somewhere, or to post letters when I went to my Welsh class. Completing several errands on one trip saved time. It also saved petrol, which was important as the farm was several miles from amenities (e.g. supermarket, post office, bank) and petrol was considered to be more expensive in rural than urban areas. This perception is reflected by Defra (2012) who observe that in 2012, fuel in ‘sparse rural areas was 2.1p per litre more than the national average’.

7.4.2 Tea

Taking a break for a cup of tea and a snack was a key part of everyday life and routine at Fferm Ysgawen. The frequency and timing remained much the same, with one break at 10.30 in the morning and another at 3.45 in the afternoon. At the appropriate time, Llew would interrupt work to call “Clare! Paned! [Cup of tea]” and we would return to the farmhouse to put the kettle on and take a seat around the table. Tea was the most favoured drink at Fferm Ysgawen, but coffee was occasionally made for visitors, and Cerys preferred orange juice. Snacks were usually sweet biscuits, savoury crackers, cheese, and fruit. When I left the farm on brief occasions to complete some written

work and occasionally whilst I was on the farm, I enjoyed making something to add to the snacks. I quickly became associated with this, especially with the children. Cerys once whispered when I arrived on the farm “have you brought the tin [the tin I used to store the snacks in]?” and Angharad always washed it so “you can fill it up again!”. This gave a personal sense of contribution and connection, which was linked to trying to become more settled and integrated at Fferm Ysgawen. Different people were present at each of the tea breaks. The 10.30am break would usually involve people working out on the farm, such as Llew, Dafydd, myself and anyone helping out or visiting. However, the break at 3.45pm also included Angharad, Cerys and perhaps some of their friends, who had all just returned from school. Often, Rhiannon would also often be there, usually prior to taking the girls and their friends to an after-school activity.

The tea break was not simply about quenching thirst and hunger, but allowed a break from work to have a chat and socialise. This chat was always in Welsh, apart from when people chose to translate for me. As Llew said “Welsh is the community language, that’s what we speak every day, at home, around the table”. This connection between tea breaks as a social activity and the Welsh language was highlighted when Rhiannon set aside a mug, detailed with instructions of how to make a perfect cup of tea written in Welsh poetry, as my own to drink out of each day. Rhiannon said, “this mug is good for you, because it will help you with your Welsh”. Having my own mug in the cupboard illustrated my increasing embeddedness as ‘part of the family’ and my place in social activities such as tea breaks. However, it also emphasised

the necessity of learning, understanding and speaking Welsh to becoming even more integrated within these contexts.

To illustrate the content of the discussions during breaks, the 10.30am tea break was usually spent discussing the farm, the condition of the livestock and crops, the tasks that needed to be completed, and what was going on in the local area. This enabled me to build up a picture of different perspectives on the farm and its surroundings that proved to be particularly informative for the study. Moreover, this discussion provided an ideal foundation for me to contribute by asking focused and 'in-the-field' questions, which further enhanced the relevance of the 10.30 tea break discussion to the study (see Chapter 4, Riley, 2010). The 3.45pm tea break focused on Angharad and Cerys' days at school, if anyone was going out that evening and what we would have for dinner.

7.5 Reflections on Internal Dynamics and Family Farm Survival

This chapter has explored the internal dynamics of Fferm Ysgawen. It has discussed key elements such as relationships to farm land, Welsh politics, the history of the farm family, and the everyday and seasonal routines. These actions, practices and routines were carried out to uphold the motivations of producing food, maintaining a good way of life and preparing the family farm for succession. These motivations were in turn connected to a deep sense of longing for the family farm to survive. During fieldwork, this longing was revealed usually during in-depth discussions. These discussions often led to an emotional response from participants. For example, Bethan and Llew described with great pride how their daughter Angharad loved being out on

the farm as a youngster and could “sense” when an animal was sick, which indicated her potential to own and manage the family farm. This allowed them to feel assured that the family farm would continue and their name would stay on the land. This emotional and embedded desire creates the basis for two different types of internal dynamic.

First, some of the internal dynamics of the farm family have not undergone significant change. A primary example is the everyday and seasonal routine on the family farm. This was illustrated when Llew laughed at the timing of visitors’ arrival at the farm, as they always knew when there was a break for a cup of tea and a chat. The lack of change to these routines creates a sense of the resilience and durability of the family farm. The second type of internal dynamic is those which undergo significant change. For example, the farming type has changed from dairy to mixed with a specialisation in sheep. This was undertaken due to the threat to the way of life on the family farm, which was created by Dafydd’s illness. This significant threat presented a significant challenge to the survival of the family farm, because its primary source of income, dairy farming, was no longer possible. The practical changes that were made to the farming type (and the supporting routines, activities and practices) indicates the extent to which the farm family long for survival. This combination of strong durability and flux within the internal dynamics of the farm family forms a tool for their persistence.

This discussion of the internal dynamics provides a foundation upon which to overlay the other tools of survival: technology and external connections.

CHAPTER 8: TECHNOLOGY AND FFERM YSGAWEN

This section is about the interactions that occur between the farm family and forms of technology. It explores the ways in which technologies are perceived, adopted and used within the context of a family farm, investigating whether they contribute or undermine survival.

The literature review discussed a conceptualisation of the relationship between farmers and technology known as the technological treadmill, which emerged from analyses of post-war productivist agricultural change. This conceptualisation argued that family farmers' inability to access technology would result in decreases in production and eventually their demise. However, the actual survival of family farmers and the lack of viable opportunities to justify a move away from food production (e.g. diversification as part of post-productivism) suggests that they can interact positively with technology. This highlighted a gap in knowledge on the understanding of the relationships between family farmers and technology.

The conceptual and methodology chapters created a way by which this gap in knowledge could be filled. The first part of this framework is concerned with recognising the multiple ways in which technologies are understood, adopted, used and repaired or modified on the family farm. The second part relates these actions to the motivations or aspirations of the family farm. The third part is concerned with how this connects to the survival of the family farm. The first part is investigated using ethnography and participant observation. The second and third parts are explored using semi-formal interviewing, in-the-field and focused discussions.

The chapter is structured into 5 sections. The first section details how technology was perceived, defined and understood by the farm family members at Fferm Ysgawen. Section 8.2 highlights particular pieces of technology and machinery which were considered essential on the family farm. The third section (8.3) looks at uses of technology which were hidden in the processes of the farm. Section 8.4 looks at the way in which one piece of technology could be adjusted or modified to perform multiple functions. Section 5 explores instances of reluctant or 'non-uses' of technology.

8.1 Perceptions, definitions and understandings of technology at Fferm Ysgawen

This sub-section is concerned with how the family farmers at Fferm Ysgawen perceived, defined and understood technology at the farm. It also explores how this is related to the background motivations and approaches to farming employed at Fferm Ysgawen.

There is very little work in agricultural geography on how farmers define and understand technology. Under the technological treadmill model, the largely forced adoption of technology meant that farmers' agency, perceptions and actions were irrelevant. This was reinforced by political economy. Behavioural literature in agricultural geography on the spatial diffusion of innovations did make some attempt to understand how the behavioural characteristics of farmers impacted adoption (Ilbery, 1985). However, the use of a modelling approach that placed farmers into behavioural categories such as 'innovators', 'early adopters' and laggards' attracts the same criticism as the technological treadmill, which is a lack of

consideration for the diversity of individuals within the agricultural sector. Later work on farmers' adjustment strategies and decision-making processes does offer some insights into why farmers' adopt technology (Evans, 2009). Key reasons include economic gain, the appropriate 'fit' of an adjustment within the whole farm context, and ease of use/application. However, there remains potential to explore how family farmers first define and understand technology, before attributing them with favourable functions such as increasing profits.

Fieldwork at Fferm Ysgawen revealed the multiple ways in which 'technology' may be understood. When I undertook a visit to the farm as part of preparation for fieldwork, I asked Llew and Bethan about the technology at Fferm Ysgawen. They replied by saying, "there's not much technology here". Later in the conversation, I asked if there were any tractors on the farm. The significance of tractors in literature on technology within agricultural geography and their increasing complexity and specialisation, with the addition of tools such as yield meters and GPS systems, created a personal perception that tractors were a key example of an agricultural technology (see Ward, 1993; Tsouvalis et al., 2000; Saugeres, 2002). As a result, having heard that there was little technology on the farm, I did not expect Llew to reply with "yes, three". Therefore, there was a clear inconsistency between what I and the family farmers at Fferm Ysgawen perceived as 'technology'. Section 8.2 will look at a range of 'technologies' that were present on Fferm Ysgawen which, in addition to the three tractors included a quad bike, slurry tanker and 'Calfeteria'. A calfeteria is a portable round vessel that is filled with

milk (usually made from powder and water), which is released to calves via plastic teats fitted around the outside.

During fieldwork, as I observed and participated in the use of these various objects, I was able to note the various terms that were used to define them within the context of the family farm. Key terms that emerged were 'machinery', 'kit' and 'tools'. Being aware of and understanding these terms was integral to investigating how these objects were used at the farm. Consequently, two key arguments may be made. First, it must be recognised that 'technology' is a fluid and complex term, which requires analysis and definition. Second, within the context of Fferm Ysgawen, terms such as 'machinery' and 'tools' were significant to describe objects that might be perceived as 'technology'.

The definition and perceived small significance of technology at Fferm Ysgawen was connected to the farming approach employed at the farm. Chapter 7 discussed that the farming approach at Fferm Ysgawen was related to two motivations. First, Dafydd and Llew discussed that their "farming is about producing food". They further appreciated the wildlife on the farm (e.g. red kites) and were keen to conserve the Welsh rural landscape. Second, Llew and Bethan described how they farmed to maintain a good way of life. This was related to preserving the heritage of family farming at Fferm Ysgawen and enabling the children to have a good quality of life in the countryside. Bethan explicitly said "it's a way of life here really [...] we keep it going". This was described as being behind a lack of technology at Fferm Ysgawen. In other words, farming for a way a life meant little use of technology. This became clearer when Llew compared Fferm Ysgawen to

Hefin and Megan's dairy farm. In contrast to Llew and Bethan, Hefin and Megan were said to run a farm with an approach that was efficient, productive and "business-like" (Llew). As a result, Llew described them as being more "technologically 'in tune'" (Llew). Llew said to me "I'll take you up to see [Hefin's] dairy farm. You'll see some technology there". As a result, it may be argued that how 'technology' is defined and its perceived presence or importance within a family farm is determined by the motivations and approaches that are significant on the farm. This also indicates that technology is used to ensure the survival of a family farm, which is understood not purely as economic/productive success, but as the preservation of a 'good' way of life.

8.2 Essential 'technology'

This sub-section will explore the range of machinery and kit, tools and technologies that were significant at Fferm Ysgawen. It is particularly concerned with highlighting how the use of these objects was connected to the underlying motivations for farming at Fferm Ysgawen. Moreover, it will discuss how various farm family members interacted and worked with these objects to complete a variety of tasks and activities. This creates a multi-faceted view of the co-constitutive relationship between technology and family farmers, which reflects a theoretical concern with technological knowledge-practices .

Some agricultural geographers have argued that the power and complexity of agricultural technology has impacted the skills, knowledge and work of farmers and their families. For example, Tsouvalis *et al.* (2000) write that the

increasing use of technology means that farmers are now required to have such specific technical knowledge and skills that the way they identify themselves has been completely transformed. The 'traditional farm worker' has become the 'farm technician' (Tsouvalis *et al.*, 2000, p.921). Brandth (1994) and Saugeres (2002) discuss how this has affected certain farm family members more than others, particularly the head male farmer. Saugeres (2002) argues that technology has led to a re-affirmation of the masculine nature of farming and the increasing marginalisation of women from farm work. For example, while the tractor has made farming less physically demanding, which could be expected to have enabled women to undertake more manual work, some male farmers remark that the technical knowledge and physical strength required to operate tractors means that farming remains 'an exclusive male space' (Saugeres, 2002, p.156).

These arguments are useful to consider in relation to the pieces of technology and machinery at Fferm Ysgawen. These objects comprised of: three tractors, one quad bike, one telehandler (a vehicle which can be fitted with various attachments such as grabber or bucket), one Calfeteria (a milk feeder for calves) and silage pit mats (see figure 20).

Figure 20: Tyres and silage pit mats



Photograph taken by researcher

As a whole, this range of objects is interesting as it does not directly aid the production efforts of Fferm Ysgawen. Rather, these technologies were deemed significant for two different reasons. First, some technologies were important because they enabled the farm family to complete the everyday tasks that enabled the farm to produce enough to survive. Second, other technologies were present because they contributed to the maintenance of a good quality of farm family life. This reflects the central motivations for farming that were employed at Fferm Ysgawen (see Chapter 7).

In terms of technology that was used to complete everyday tasks integral to family farm productivity, the quad bike is a particularly good example. During my first week on fieldwork, Llew taught me how to drive the quad bike, which enabled me to experience personally and participate in its

use in farm activity. Once I had grasped the basics, I was encouraged to use the quad bike to check and feed the animals usually once or twice a day. Together, Llew and I would also use the quad bike to complete more irregular tasks like herding animals and travelling to administer medication to sick animals. While these tasks were considered basic and mundane, the quad bike had led to such a dramatic decrease in the time and effort spent on these tasks previously that it was considered essential for family farming.

The farm family were also interested in technology that contributed to maintaining a good quality of life. Llew said, "I'm a big believer in spending money to make things easier", and this translated to investing in technology to make mundane, tedious or messy jobs less of a chore. A good illustration of a particular piece of kit is silage pit mats. These are flat mats made out of hard plastic that sit on top of plastic sheets that cover silage after it has been cut. Silage needs to ferment over several months and so it is covered by plastic and weighed down with these mats to remove as much oxygen as possible, which causes rotting and spoilage. Before purchasing these mats, old car tyres were used. This is a very messy, intense and time-consuming job as many tyres are needed, which are awkward to carry and usually filled with stagnant water after being stored outside for several months. As Llew said, "[the mats] are expensive, but they save time and the mess. It's a horrible job using the tyres". Consequently, the mats reduce the amount of tasks considered menial or troublesome, which makes a key contribution to the preservation of a good quality of life at Fferm Ysgawen.

It is clear that at Fferm Ysgawen, technologies (and other related objects) are selected and used in accordance with their motivations for

farming. Consequently, contrary to the argument of Tsouvalis *et al.* (2000), technology has not transformed the knowledge, skills and work of farm family members. Rather, family members are active in transforming and 'fitting' technology to fit within the motivations, work and skills of their farm context. This illustrates the presence of a co-constitutive relationship between farm family members and technology.

This placement of technology within the whole farm context meant that several family members either used or were familiar with how to use the various objects. For example, when Llew went out to the fields with the tractor to complete activities such as spreading slurry or cutting hay, he was often not alone. The girls, Angharad and Cerys, often wanted to go with him. In fact, the tractor was made for this type of interaction, as it had a passenger seat (cf. Laet & Mol, 2000). They enjoyed 'helping', learning about the tractor and the various activities it could be used for, and chatting with their father. Llew was also keen on the girls being out and about on the farm, and so encouraged them to 'jump in' the tractor. It also gave Llew a chance to teach and 'enculture' the girls in the ways and practices of the family farm. During fieldwork, I too joined Llew in the tractor and was even given some lessons in how to drive it. Consequently, contrary to Saugeres (2002) argument that the use of technology has led to a single usually male farmer being involved in farm work, at Fferm Ysgawen the tractor (especially with its passenger seat) invites other family members (including females) to engage with farm work.

8.3 'Hidden' technologies

This section is about engagements with technology at Fferm Ysgawen that were 'hidden' or absorbed within processes or products. These engagements were centred on the possible presence of genetically modified organisms (GMOs) in animal feed. While research and political discussion considers GM as a future reality or an 'extra-ordinary' presence for farmers engaged in field trials, discussions at Fferm Ysgawen indicate that GM is a disregarded element of current mundane and everyday farm-based activities.

One afternoon, I joined Llew to collect some feed from the barn for the sheep. The feed was in pellet form and used to supplement home-grown oats and barley. As we were filling our buckets with the feed, I asked Llew whether he knew if the feed contained any genetically modified ingredients. Uncertain, Llew and I checked the packaging and read that certain ingredients such as soya were followed by the symbol '(GM*)'. Although not completely sure, he said that it was likely that the symbol meant that the feed did contain genetically modified material. During fieldwork, we routinely bought the feed from a general store about 3 miles / 5km from the farm. This particular feed was stocked as a well-known and popular national brand. This possible inclusion of genetically modified organisms in widely available animal feed is acceptable because the animal itself is not genetically modified. This use is reflected in the following statement issued by the Department for Environment, Food and Rural Affairs that:

'imported GM commodities, especially soya, are being used mainly for animal feed [in the UK]' (Defra, 2010b).

However, this is in stark contrast to the complete prohibition of commercially exploiting genetically modified organisms. It is also dissimilar to the exciting future technological opportunity that emerged from Oreszyczyn's (2005) work. Rather, genetic modification has already been absorbed within the animal feed to such an extent that it is as unnoticed and mundane as the animal feed itself. This indicates some similarity with Whatmore's (1995) description of the subsumption of 'raw' farm products (e.g.) potatoes within the industrial agri-food system. Whatmore (1995) argues that this leads to a 'valorizing [of] agricultural products' into consumer goods (e.g. potatoes are manufactured into crisps and synthetic meat products) at the expense of the farmer who is forced to take a marginal position (Whatmore, 1995, p.42). However, in the case of GM animal feed, there is little valorisation: GM technology is subsumed within a product that is commonplace and banal. Furthermore, this means that while farmers participating in Oreszyczyn's (2005) study expressed concern about not having particular skills, GM in animal feed has very little impact on agricultural practices, activities and knowledge.

8.4 Multiple uses of one technology

The explanatory power of the concept of the technological treadmill is dependent on technologies that increased food production. However, section 8.2 discussed the importance of technologies that save time or make farm work easier. Some technologies and forms of machinery on the family farm such as the telescopic handler or tractor were manufactured to perform different functions. These functions could be extended further with the

purchase of additional attachments. To illustrate, Llew and I changed the attachments on the telescopic handler to pick up bales of hay and transport items such as silage and waste. However, there were a few occasions when the family members made their own adjustments to pieces of technology to maintain or increase their functionality.

Llew and Dafydd worked together to repair pieces of technology. For example, one attachment to the tractor contained two metal plates edged with teeth, which revolved to slice pieces of hay into smaller pieces. This made the hay better for use as animal feed. However, through years of use, some of the teeth on the plates had begun to disintegrate which reduced its efficiency in cutting the hay. Consequently, Llew decided to take apart the attachment to try and replace some of the teeth. Llew, Dafydd and I worked together to take the pieces apart and clear out the old bits of hay. Using some sheet metal and tools stored in one of the barns (a welder, angle grinder and sander) Llew and Dafydd created and attached new teeth for the plate. I observed the process, watching as they used rough and guessed approximations to make one tooth, before checking its fit and using it as a template for the others. This is very similar to the process of making a farm gate that Gray (1998) observed during his fieldwork with farmers in Teviothead.

Llew also used technology and machinery for different functions than those intended by the manufacturer. On arriving at the farm one day, Llew and I began to discuss the plan for the morning and his latest innovative idea to convert a slurry tanker into a water carrier to clean the cattle shed ready for storing silage:

Llew: "Clare, I have a plan for cleaning the big cattle shed but I'm not sure if it'll work. You know the tank we used for spreading the slurry?"

Clare: "Yes..."

Llew: "Well, we're going to take it up to the lake, fill it with water and bring it to the shed. Then you're going to stand at the bottom and hold the hose while I control the pressure, OK?"

Clare: "OK, but I'm getting my camera, I can safely say no one's thought of doing this before".

Figure 21: Using the slurry tanker to carry water



Photograph taken by researcher

This except shows the variety of ways in which farmers use their imagination, knowledge and experience to convert or modify the most mundane of technologies to achieve different tasks across the family farm context. This

reveals an approach to farming that involves “making do” by being “good at a bit of everything” such as modifying machinery, carpentry, metalwork and providing some veterinary care for animals (Llew). This implementation of this approach was made possible by the technology itself. As Llew said “the simple technologies are often the best” as it is possible to modify or mend them yourself.

8.5 Reluctance / non-use of technology for agricultural purposes

This sub-section explores technology that was present at Fferm Ysgawen, but was not used for agricultural purposes. The key example is a computer that was situated in the living room / study of the home farm. Current knowledge of the use of computers on farms suggests that uptake has been slow, especially for use in relation to the business (Warren, 2000; Brown et al., 2000). This has been related to a lack of knowledge about computers within the farming community. However, this work is grounded in survey / questionnaire methodologies, which have not allowed for an in-depth assessment of the perceptions and processes that encompass engagement and non-engagement within the farming community. This section explores how the computer was used on Fferm Ysgawen and why it was not used for an agricultural purpose. One way in which a computer can be used on a family farm is to register the birth of cattle with the British Cattle Movement Service (BCMS) online. The following example describes the birth of a calf at Fferm Ysgawen and subsequent discussions about the role of the computer.

During the first few weeks of fieldwork, the cattle at Fferm Ysgawen underwent testing for Bovine Tuberculosis (TB). After the testing, the vet

examined some of the cows for pregnancy. Establishing that some were positive, the vet encouraged me to put some gloves on and feel the calves for myself. Llew and Dafydd picked out a calm cow and I nervously tried to find the calf. Finally locating a small hoof was a strange but amazing moment and from that point, I was keen to observe the gestation of the calves and await their birth. Indeed, several months later the cows were moved nearer to the home farm for closer observation and I was able to watch a birth through the kitchen window. However, it was apparent that what I thought of as a profound and special event on the family farm was actually part of everyday life and normality. Indeed, my excitement was met with surprise and laughter. Following the birth, the mundaneness of this event became clearer to me as some additional paperwork had to be completed. This involved registering the birth with the British Cattle Movement Service (BCMS), which would lead to the issuing of a cattle passport. While Rhiannon was filling in the details of the forms ready for posting, she showed and explained the process to me. I asked if she knew that a lot of form-filling required for the BCMS could now be completed online. She replied by saying “Yes. But I’m sorry, it’s all wrong using computers for everything. Things can get lost”. Later on in fieldwork, I was shown some of the paperwork (which included maps, receipts and forms) which related to all aspects of farm management. This was meticulously stored and ordered in envelopes and plastic wallets in a downstairs room of Dafydd and Rhiannon’s house.

Following this discussion with Rhiannon, I asked Llew if he used any of the farm or herd management programs that are currently available. He replied by saying that “We’ve got the software [a herd management program had been

downloaded on the computer], but we haven't used it". Farm management software can be used on sheep farms for tasks such as keeping a flock register, maintaining a record of medicines administered, calculating sales performance and keeping reports on each ewe (see SUM-IT, nd.). However, over the course of fieldwork, I observed Llew complete activities that were very similar to those he could have undertaken using the computer. For example, he was able to recognise each cow from their markings, remember which ewes had been given medication for illness in order to check on her later, tell me in detail about the changing prices received for spring lambs, and describe the life history of each ewe as she passed through the race. This was completed via a series of endless 'mental notes' that Llew seemed to have stored in his mind. During fieldwork, I helped to make these notes as Llew often asked me to "remember this number", "write this down" or "don't let me forget that...".

Despite the non-use of computer for agricultural purposes at Fferm Ysgawen, it was used for a variety of other purposes. The most important use was to enable Angharad and Cerys to complete their homework from school, which occurred most evenings. My interest in technology, geography and religious studies background meant that I was sometimes asked to help them. We would then sit together researching things on Google, putting together posters in Paint and writing up pieces in Word. In exchange, they would correct my homework for my Welsh course. When there was a lull in farm activity, I would also use the computer independently to complete writing for my thesis and to check University email. The computer was also used for sending and receiving emails from friends, internet shopping and visiting social

organisation sites such as Facebook. Llew also asked me to help him download Skype (an online video telephone service) and a program for his Kindle (an electronic reader).

These discussions and experiences centred on the computer at Fferm Ysgawen highlight three different types of technological engagement. First, the computer was not used for agricultural purposes. This reflects what has been discussed as a reluctance to use computers for farm management (Warren, 2000). Second, further investigation discovered that very similar to tasks to those involved in computer-based farm management were undertaken using different means. For example, Llew took 'mental notes' and did things 'by hand', and paperwork was carefully organised and stored. As a result, contrary to literature that suggests that the non-use of computers is related to a lack of knowledge, all family members were familiar with computers and their functions to some extent. Rather, the reasoning behind not using the computer for agriculture at Fferm Ysgawen was a concern about the reliability of computer-based storage and the fact that a successful farm management system was already in place.

8.6 Implications for survival

This chapter has discussed the use of technology at Fferm Ysgawen. Following the element of the conceptual framework that is concerned with the multiple knowledge-practices that surround technology, it has sought to understand these objects from the perspective of the family farm members themselves. It then investigated the varied ways in which the family use, and do not use, technology.

The range and detailed of the technological engagements at Fferm Ysgawen were related to the motivations of the farm family to conserve finance and allow time for the enjoyment of their distinctive way of life. For example, silage pits mats were adopted because they save time, effort and the unpleasant experience of carrying tyres filled with dirty water. A tractor attachment was modified to save an unnecessary investment in a new piece of kit.

In turn, these motivations were connected to a longing for the family farm to survive. It is important to recognise that the family perceive the survival of the farm in a particular way. Survival of the family farm as an economically successful enterprise was not sufficient. The family members were more concerned about the survival of their way of life, which involved pleasant farm work and time for leisure activities. Thoughts about the survival of the family farm in this way were displayed when Llew used technology to teach his daughters about the running of the farm. This was undertaken because it was hoped that in the future, one of them would succeed and inherit Fferm Ysgawen. From the perspective of family farmers, bringing up or 'enculturing' children with the idea that they will run the farm is integral to its survival (Price, 2004).

The chapter has also suggested how the family farm might survive through specific forms of agricultural change, such as those anticipated under neo-productivism. For example, it was possible to look at one of the key technologies related to the implementation of neo-productivism, genetic modification, on Fferm Ysgawen. The use of this technology on the family farm was only revealed when I asked specifically about the contents of the

animal feed. Up until this point, the presence of genetic modification had been hidden within the practice of purchasing the feed from the local store and feeding it to the sheep. This indicates that although genetic modification has attracted vociferous debate and attention, its application on family farms is already part of mundane everyday activity. This ease of introduction and implementation indicates that this technology might prove useful to the adjustment and survival of family farms through neo-productivism.

CHAPTER 9: THE EXTERNAL DYNAMICS OF FFERM YSGAWEN

This chapter considers the family farm Fferm Ysgawen within a broader context of individuals, institutions and entities, which will be used to construct a map of an intricate and complex agricultural setting. This exploration highlights connections that are established for purposes that incorporate the business, cultural, social and technological facets of the family farm. It will also consider how family farmers draw on this context to interpret, discuss, reject and use technology. On a broader level, it is concerned with how the farm family use external connections to survive throughout periods of agricultural change. This chapter is inspired by literature concerned with knowledge-cultures, networks and food chains (Tsouvalis *et al.*, 2000; Murdoch, 2000). This chapter argues that the external connections that are established and maintained by family farmers contribute to their ability to survive through periods of agricultural change.

Chapters 7 and 8 focused on the family farm and the role of technology within it. Chapter 7 revealed the dynamics of the family farm, which included everyday routines and practices, the roles and relationships of family farm members, and seasonal events. Chapter 8 investigated the farm-based engagements with technology, which included rejection or non-use, multiple use, and hidden use within products or processes. These two chapters are restricted in their view to within the boundary of the family farm. However, agricultural geographers working from a political economy approach during the late 1980s were keen to assert that family farms are not closed, bounded and insular (see Chapter 3). Rather, they exist alongside a multitude of individuals, institutions and entities, with whom they engage with on a daily

basis. More recent work has discussed how farmers use connections that extend beyond their farms for a range of purposes including knowledge (Tsouvalis *et al.*, 2000). Consequently, this chapter is centred on the exploration of the external connections of Fferm Ysgawen. On a broader theoretical level, this implementation reflects a drawing together of concern with the external (associated with political economy) and internal characteristics of family farming. However, unlike modified political economy which drew together these characteristics in order to use the external to *look down* at the internal, this chapter will use the internal to *look up* towards the external.

The chapter is structured into five sections. Section 9.1 begins with a map of the external connections of Fferm Ysgawen. Following the conceptual framework (Chapter 3), this includes agricultural and non-agricultural connections. This enables an account of their nature, range and distance from the family farm. The following sections discuss significant themes that emerged from the external connections within and across the scalar boundaries. The themes were identified in two ways. First, farm family members highlighted the comparative importance of particular connections by choosing to discuss or interact with them more frequently or in greater depth. For example, regular trips to the store (to purchase feed) and abattoir indicated the significance of the agri-food system to the family farm. Second, investigating the internal dynamics of the farm family and their engagements with technology highlighted the importance of particular external connections. For example, the motivation of the farm family to maintain a good way of life was partly based on their enjoyment of social occasions off-farm such as

going to country shows, having a meal at a restaurant or helping out at other farms. Llew also sought the opinion and experience of other farmers and organisations when deciding whether to purchase a new piece of technology. This shows the connection between technology and the social life of the family farm, which was created through external connections. There are many connections, so for the purpose of discussion, they are organised in the following sections. Section 9.2 analyses the connections between Fferm Ysgawen and the agri-food system. 9.3 explores the local, community based social life of the farm family. Section 9.4 considers how external connections were associated with engagements with technology. Finally, section 9.5 discusses the rejection of and change to external connections that occurred over time.

9.1 The external connections of Fferm Ysgawen.

Chapter 3 highlighted the importance of external connections to our understanding of contemporary family farming in the UK. Concepts such as food chain analysis, networks and knowledge-cultures were discussed. However, applications of these theoretical perspectives have been restricted to limited, singular elements of family farming practice. For example, Tsouvalis *et al.* (2000) look at the introduction of precision-mapping technology as a way to explore shifts within farming knowledge-cultures. This work does not recognise other aspects of the life of a family farm such as the social (for example, interactions with friends and neighbours), cultural (e.g. actions maintained by habit) or the natural (for example, working with different species of livestock). By extension, it does not consider how these aspects resonate in the external connections of a family farm. In order to fulfil the

potential for research that this limitation creates, this sub-section identifies and analyses the range of external connections that extended from Fferm Ysgawen.

External connections that radiate from family farms are inherently geography. Individuals and institutions are usually tied to set physical locations and their connections will weave through the landscape. The geographical manifestation of networks has been briefly suggested by Murdoch (2000) who argues an understanding of them has implications for policy that seeks to develop the rural landscape and environment. However, there remains potential to consider the geography of the external connections that centre on a family farm. As a result, this section considers elements of the connections of Fferm Ysgawen such as size and scale. Many of the connections of Fferm Ysgawen are considered by the family members to be predominantly 'local'. For example, a significant relationship might exist between the farm and the local abattoir. However, other connections extend to regional animal marts or national agri-environmental schemes. The comparative importance of connections may also result in furrows of different depths across the landscape. For example, the farm family may prefer to buy animal feed from a local supplier but be forced to use a larger national chain store for more specialised products. Over time, connections that were once so significant that they became ingrained and habitual may also change, lose their importance or be replaced. For example, if a well-respected representative for an agricultural merchant retired, the farmer might choose another merchant. As a result, this sub-section will map and explore the

geographical characteristics of the external connections of Fferm Ysgawen.

Figure 22 depicts all the external connections of Fferm Ysgawen:

Figure 22: The external connections of Fferm Ysgawen.

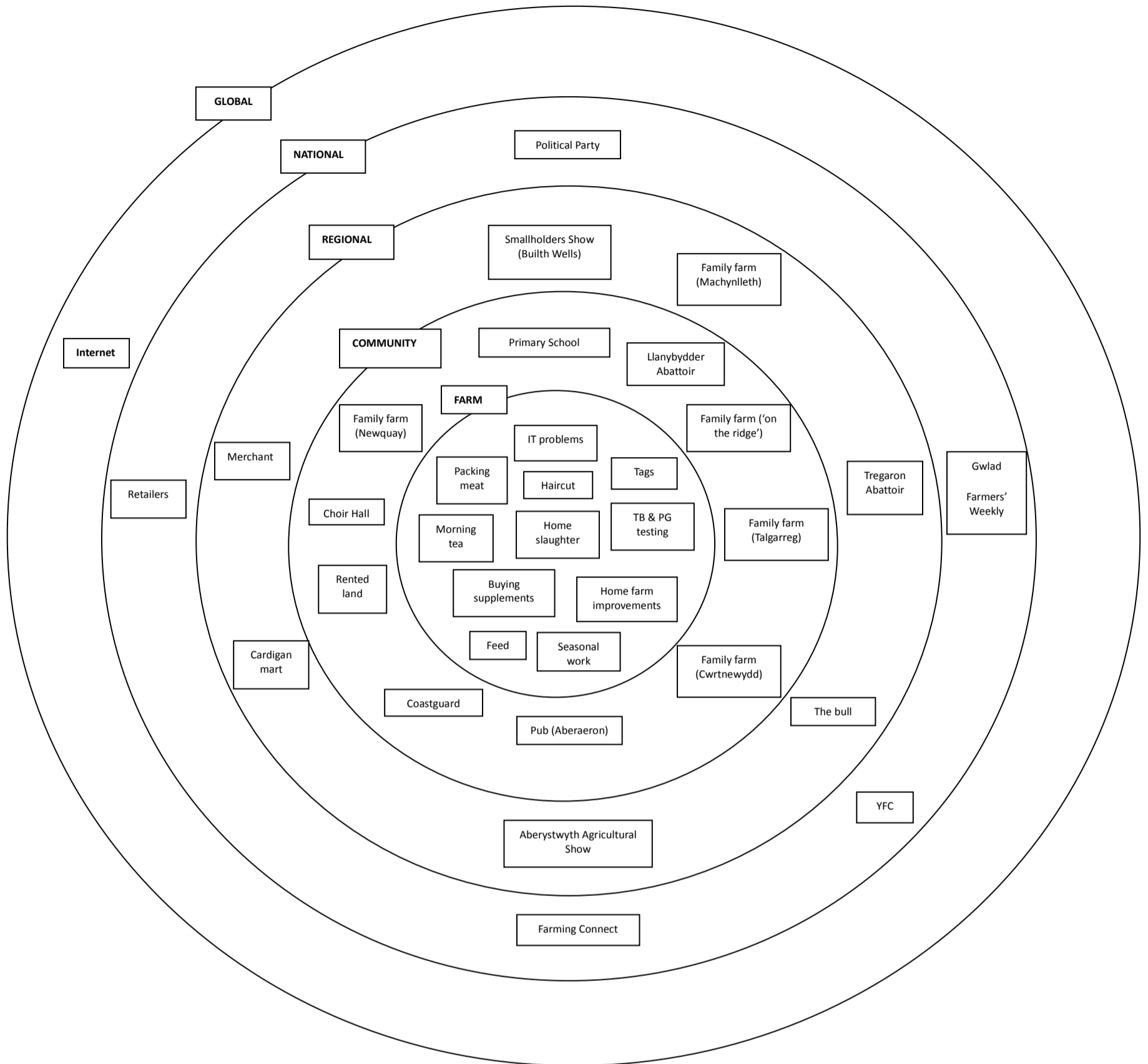


Figure 22 shows that the connections from Fferm Ysgawen reached worldwide. This was primarily through holidays taken prior to the start of my fieldwork and use of the Internet. However, holidays were relatively short-term (for example, one to two weeks) and were not considered to be related to the day-to-day running of the farm (they were not, for example, seen as similar to trips organised by farming organisations such as the Young Farmers' Club to observe farming practice in countries such as Australia or New Zealand). Rather, they were a chance for recuperation and exploration away from farm life. Moreover, internet sites were rarely used to access individuals, products or information which originated from outside the United Kingdom. For example, sites such as Ebay (nd.) (an online auction site) or Next (2013) (a clothes retailer) were very occasionally used (twice throughout the course of my fieldwork) to purchase products which were posted from within the UK. The social networking site Facebook (2013) was used more significantly (most evenings a week) by Llew, but to keep in touch with friends he had met within the local community (most of whom were still resident locally). There was also a connection to Europe through agricultural policy which resulted in receipt of the Single Farm Payment, but this was not considered to be a relationship in which the farm family actively engaged. Rather, it was one which was seen as imposed or necessary. Due to the relatively minor significance of worldwide connections, it is therefore more accurate to conclude that the majority of external connections of Fferm Ysgawen extends as far as the boundary of the UK.

Within the boundary of the UK, the map of external connections highlights four significant geographical scales: national, regional, community

and farm. The first two scales reflected unitary or county council boundaries: the national being the country of Wales and the regional the county of Ceredigion. However, the community scale was more difficult to define as perceptions of the local community held by members of the farm family did not reflect the parish or village boundary. For members of the farm family, the local community encompassed the urban areas of Newquay, Aberaeron, and Llanybydder. Looking at the distance between Fferm Ysgawen and these locations, the radius of the perceived community scale is approximately 19.3km/12 miles. The final scale is that of the family farm itself, as individuals and products from external locations were entertained and used on the farm.

Each scale is important for Fferm Ysgawen for different reasons which are based on the nature of its connections and their purpose for the family farm. Literature in agricultural geography has begun to unpack the significant elements of a network. Murdoch (2000) highlights three elements: social, technological and natural. Applied to the connections of Fferm Ysgawen, these elements are meaningful. For example, the natural encompasses the connection made by a bull when he left a regional farm to breed with cows at Fferm Ysgawen, or the movement of a group of lambs from the farm to a local abattoir. The technological highlights the connection made through the adoption of silage pit mats at Fferm Ysgawen based on the recommendation of a local farmer (see also Chapter 8). However, these three specific elements fail to explain the important themes of either the scales or individual connections.

Theorising the connections of Fferm Ysgawen, it is possible to attribute some specific characteristics to each scale. For example, the national scale

contained connections with Government-run schemes, initiatives and policy. While the European Union administers the CAP, a perceived lack of real two-way engagement meant that the farm family felt that their national connections were more significant. As a result, the national scale is associated with the legislative framework through which Fferm Ysgawen is governed and regulated. The regional scale is characterised by occasional events, which occurred either seasonally or annually. These included visits to agricultural shows, the purchase of 'special' items (for example, a bull) and selling cows to an abattoir in South Wales using a livestock haulier. The community scale contained connections with family, friends, other farmers, local enterprises and neighbourhood concerns. Consequently, this scale is characterised by the social interactions of the family farm members of Fferm Ysgawen. The on-farm scale contained connections with individuals who often came to the farm for the purpose of farm work, but whose visit often initiated social interaction and enjoyment. For example, after they had carried out some work on the farm, visitors were invited into the main farmhouse for meals and tea breaks. As a result, the on-farm scale is characterised by close and informal social interactions that occur within the boundaries of the farm.

Having identified the characteristics of the scales of the connections surrounding Fferm Ysgawen, it is possible to make some comments on the comparative importance of each of them for the family farm. As distance increases from the family farm to the national, the connections become less social and more regulatory or legislative. This transition is significant because it is reflected in the importance attributed to the scales by the family farm members. The social interactions and connections embedded in the

community and on-farm scales were considered to be very important and enduring. The family gave a significant amount of time, resources and energy to their social connections and simultaneously drew on them for advice, on-farm help and leisure. As will be discussed in detail later in the chapter (see section 9.5), significant changes to these connections were rare and provoked shock and disappointment. In contrast, agricultural policy and regulation which characterised the national scale was considered to be constantly in flux. For example, the introduction of agri-environmental schemes was attributed to the uncertainty and whim of unknowing politicians to prioritise wildlife over food production (see Chapter 7). This meant that the community and on-farm scales were given far greater importance and respect than the other scales. The social interactions within the on-farm and community scales provided a way through which to interpret and implement elements of the other scales. Or to use Murdoch's (2000) elements of the network, the technological and natural elements were often mediated through the social. In addition, the success of government initiatives such as Farming Connect and Gwlad is dependent upon organisation which builds on the existing connections within the community scale.

Despite the strength of the boundaries between the scales, it is important to note that the boundaries were also contingent and blurred. For example, section 9.2 will discuss how one of the outputs of the farm, lamb, crossed several boundaries to sell in multiple locations of several different scales. Indeed, this transgression is important to the economic and productive success of farming lamb at Fferm Ysgawen. The connections also changed over time: social connections were lost, emerging forms of technology were

adopted and the researcher herself introduced new connections (see sections 9.4 and 9.5). However, the importance of the social connections within the community scale remained strong, acting as a type of anchor for the farm family's activities, decisions, engagements and practices.

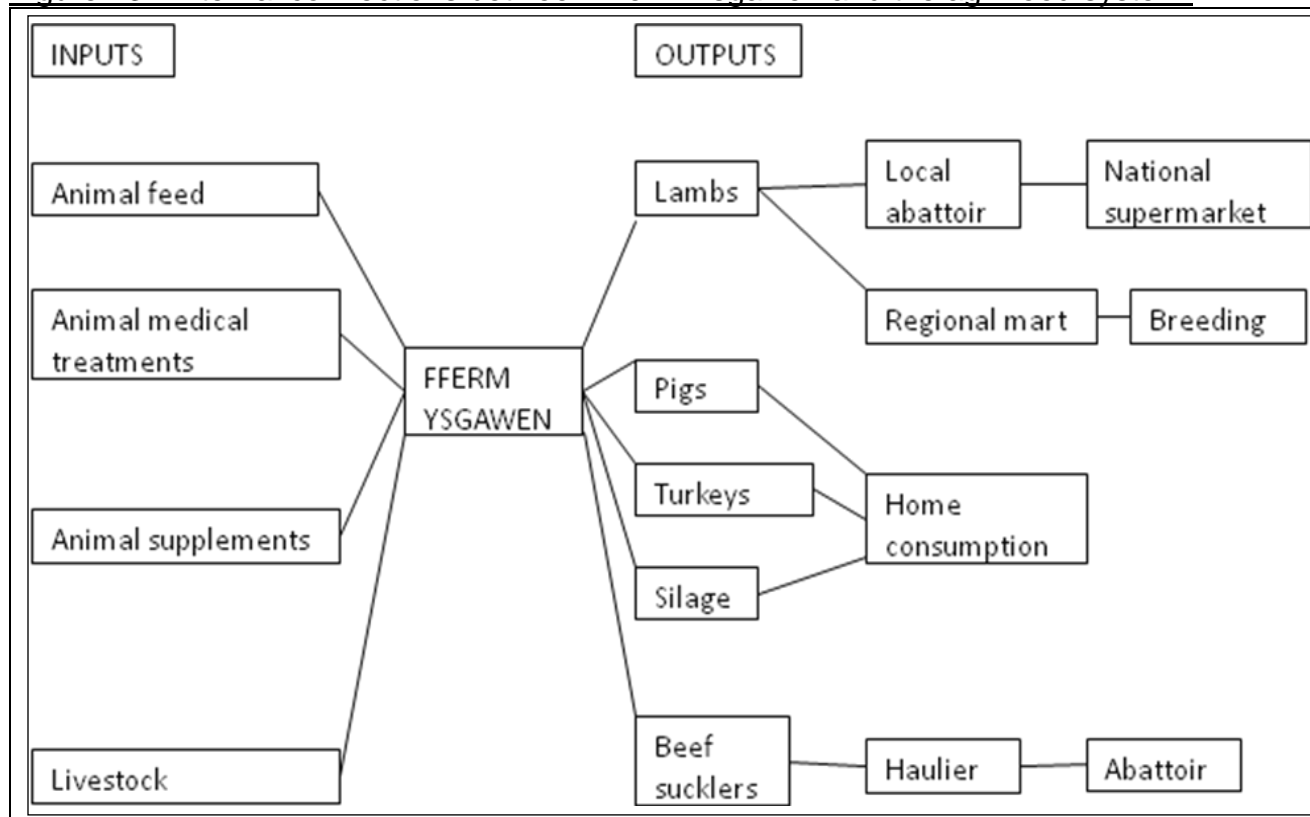
9.2 Fferm Ysgawen and the agri-food system

The connections between family farms and other elements of the agri-food system have been the subject of significant theorisation by agricultural geographers. A key example is Whatmore *et al.*'s (1987b, p.21) use of the concept of subsumption to discuss how family farms are defined, penetrated and controlled by relations with 'external corporate capitals' (see Chapter 2 and 3). These include processing companies, manufacturers of technology and agri-chemicals, and banks or capital lenders (Whatmore *et al.*, 1987a&b). This analysis does not consider the autonomy, control or influence that farm families have on their connections with the agri-food system. In addition, the agri-food system within which farm families are subsumed is considered to be guided by purely productive and economic forces. All elements are considered to seek to produce the most food for the lowest price and the highest profit. However, other perspectives utilised by agricultural geographers which emphasise the behavioural or cultural facets of agriculture have found that while productivist motivations are strong, farmers' are actually encouraged to make changes by a range of factors. These include preserving inheritance for offspring (Price, 2004) and ensuring new elements such as technology 'fit well' with the current farm set-up (Evans, 2009).

More recently, interest in 'local' 'quality' food has led to understandings of the shortening or localisation of 'food chains', a concept that suggests the vertical alignment of family farms and other elements of the agri-food system (Renting *et al.*, 2003; Ilbery & Maye, 2005). These conceptualisations of food chains suggest linear connections between farm families and a narrow range of other elements of the agri-food system. Furthermore, as the shortening of food chains is attributed to consumer interest in 'local food', there is scope to consider the impact of farmers' choices and actions on the spatiality of the agri-food system.

This section will investigate the connections between Fferm Ysgawen and the broader agri-food system. Figure 23 shows all the connections that emerged during the period of fieldwork between Fferm Ysgawen and the agri-food system:

Figure 23: External connections between Fferm Ysgawen and the agri-food system.



It is clear that there are a significant number of connections between the family farm and a range of external elements of the agri-food system. These include individuals such as agricultural reps and vets, companies like abattoirs and marts, and farm products (e.g. animal feed and anti-worming treatments). Rather than constructing a linear 'food chain', these connections construct a circular formation of external relations. This suggests that the family farm appreciate having a variety of options with which to engage for their off-farm requirements.

In terms of spatial significance according to the scales identified in section 9.1, most connections extend as far as the national UK boundary (a notable exception is the input of animal feed containing GM. However, the store where this is purchased is within the community boundary). Some connections are also indirect, as they are mediated through other organisations or individuals closer to the farm. For example, Fferm Ysgawen is connected to Sainsburys, a national supermarket, through an abattoir located in the regional scale. There is also a relationship between the number and frequency of engagements and the scale. Occasional monthly activities such as taking lambs to the abattoir usually took place within the regional scale. More frequent weekly or fortnightly activities such as purchasing animal feed occurred within the community scale. This analysis emphasises the importance of the community scale to Fferm Ysgawen that was discussed in section 9.2.

For Fferm Ysgawen, the agri-food system may be split into two parts: inputs and outputs. The remainder of this section will explore each in turn. On-

farm processing of these inputs and outputs, which involved external entities, will be discussed in section 9.3.

9.2.1 Inputs

The primary inputs for the farm identified during the period of fieldwork were animal feed and medical treatments, supplements and livestock. Animal feed and medical treatments were purchased from stores a few miles from the farm. Llew and I visited these stores on several occasions and I visited once on my own. We usually bought pellets for lambs, anti-worming treatments and pig feed. Many of these products were manufactured by international businesses such as *BOCM Pauls*. The purchase also provided an opportunity for socialising with local trades people who had grown to be friends. We would always stop to chat about the family, products on sale and what was going on in the community. As a result, while the products were national brands, the socialisation that surrounded their purchase meant that this engagement occurred in the community scale. For the family members of Fferm Ysgawen, purchasing from local people also meant buying products from people whom you knew and could trust. Dafydd articulated this when he chose to buy a particular product in a local shop, where it was more expensive than in a national high street chain store. Rhiannon exclaimed “I don’t understand him, it’s the exact same thing!”. Dafydd responded by explaining “buy local and you know what you’re buying...it’ll be better quality”. This highlights that when purchasing items for the farm, factors such as maintaining social relationships and trust in suppliers were more important than low cost (cf. Whatmore *et al.*, 1987a&b).

The farm family trusted their local suppliers and were therefore keen to support emerging ones. When a representative of a supplier of animal feed supplements visited the farm, Llew invited him in for a cup of tea or *paned*. Llew took time with the agent to look through the catalogue, ask questions, enquire about his family and share some banter. Later on, after the rep had left, Llew discussed what he had ordered and the reasons why. He told me that the rep was the son of a fellow farmer who was trying to establish a career after being brought up on a family farm. While Llew considered the supplements that he purchased to be very expensive, he said that leaving the farm was a “big step” for the rep and he was “keen to support the youngster”. This unusual cost in relation to other purchases for the farm shows how different Llew motive was to gaining economically. This indicates that the family considered encouraging and protecting local suppliers to be more important than purchasing inputs at the lowest possible cost (cf. Whatmore *et al.*, 1987a&b).

During fieldwork Llew also made the decision to purchase a bull to add to his growing livestock herd. Llew had a number of cows on the farm and a new bull would ensure the birth of a new group of calves. Rather than the everyday or occasional purchases discussed in this section thus far, this was considered very unusual and out of the ordinary. Having heard about the sale of bulls from a farm within the regional scale of Fferm Ysgawen, Llew made arrangements to see them. He told me that he would like to take some people to accompany him and help decide whether or not to make a purchase. He asked Dafydd, Aled and myself. On arrival at the farm, Llew introduced us and explained our presence by saying, “they all wanted to come and have a look,

you know how it is". This highlighted the special and jovial mood felt by family farmers visiting another farm with the view to making a significant purchase. Whilst viewing the bulls, Llew complimented the farmer on his farm and asked lots of questions about the livestock which related to their age, health, nature and cost. The visit drew to a close with Llew saying that he would "be in touch". On the way home, we stopped at a pub to discuss the bulls over a drink. We all contributed to the discussion, which focused on the calm and soft-natured temperament of the bulls. As bulls are commonly considered to have a tendency to become agitated and aggressive, the docility of the herd just viewed made them particularly appealing. Llew subsequently purchased a bull and it resulted in the birth of several new calves. The process of buying the new bull highlights three key findings. First, for unusual occasional purchases which occur outside of the local scale, individuals such as family members, relatives and friends play an important role in supporting decision-making. Second, this involvement of other people and the incorporation of a visit to a farm and pub meant that the purchase also provided an opportunity for socialisation. Third, the importance attributed to the temperament of the bull indicates that the decision was not made on purely economical or productive grounds (cf. Whatmore *et al.*, 1987a&b).

This consideration of the inputs of Fferm Ysgawen and the processes by which they are purchased provides significant evidence with which to reflect on literature. Rather than being subsumed by institutions and individuals that provide inputs, as discussed by Whatmore *et al.* (1987a&b), farm families act autonomously to make intricate decisions. This decision-making is not purely guided by the desire to be productive and economic,

which is emphasised in literature concerned with the industrialisation phase of agriculture (see Healey & Ilbery, 1985), but by a range of varied and complex considerations.

9.2.2 Outputs

Figure 23 details the outputs of Fferm Ysgawen and the location of their consumption. It indicates that Fferm Ysgawen had a significant number of outputs which included lambs, ewes, cows, pigs, turkeys and silage. This variety is born out of a motivation not to specialise in a narrow range of products. Rhiannon described how this originates from a mantra that she and Dafydd followed: “don't put all your eggs into one basket”. This was in case one of the products lost customer appeal (e.g. due to surplus products flooding the market) or became more expensive to produce (such as during a period of unfavourable weather conditions), leading to a reduction in sales and profit. Self-sufficiency on the farm such as growing silage for animal feed also reduced to the amount of money spent on externally-sourced inputs. This mantra resulted in Rhiannon and Dafydd farming a large variety of products (for example, crops, poultry, lambs and dairy cows) alongside running enterprises such as trout fishing and bed and breakfast. This has continued to resonate as Llew and Bethan have taken over the management and running of Fferm Ysgawen. This offers an interesting reflection on literature on the industrialisation of agriculture, which stated that during the productivist era farmers' would move away from producing a variety of goods to become more specialised and concentrated (Bowler, 1985). While the products and enterprises changed during succession, the range and variety has remained

significant. This decision is not made for pure economic gain, as supermarkets within the agri-food system often give more money for sources of significant amounts of standardised products. However, in a future context of neo-productivism, anticipated difficulties such as price fluctuations which may result in a loss of profit gained from individual products could lead to a re-think of the demands of organisations within the agri-food system. For example, supermarkets struggling to maintain profitability, particularly alongside international competitors (e.g. Aldi and Lidl) may consider accepting food of a lower quality such as marked or misshaped fruit and vegetables. This may contribute to a re-emphasis of the commitment to the diversity of outputs at Fferm Ysgawen.

Some products from Fferm Ysgawen, such as cattle, were exported to a single individual or institution within the broader agri-food system. Beef sucklers were reared at Fferm Ysgawen for their meat. The transformation of live cattle into meat encompasses a number of steps: transportation, slaughter, butchery, packaging and sale. However, the last point of contact of Fferm Ysgawen with this process was transportation, as a haulier collected all the cattle ready for slaughter straight from the farm. This selling of cattle in bulk suggests that the farm family members were primarily concerned with financial gain. The minimal interaction with the broader agri-food system also implies that the family farm may be a very small, controlled part of the agricultural sector. This is reminiscent of literature which describes the industrialisation of the agricultural sector, whereby family farms are subsumed by other elements of the agri-food system, which supports productivism and economic gain (Whatmore *et al.*, 1987a&b).

However, the actual experience of the collection of the cattle highlighted more than a simple economic transaction. Chapter 7 explained that Llew visited the cattle daily to check and feed them. During this time, he enjoyed spending time watching them, noting their growth and increasing tameness, and showing affection by calling them “bois bach” (a Welsh phrase for little boys). As a result of this engagement, when the haulier was due to arrive, Llew appeared quiet and withdrawn. He told me with a melancholy voice that “he didn’t like to see the cows go” because they had “a bit of character” and had “been here a while”. This indicates that while the selling of the cows in bulk to a haulier suggests the value of productivism and economic gain, the transfer involved significant emotion and feeling. Emotion in farming has attracted some research interest, but this has been primarily concerned with large-scale national events that have captured the attention of the media and general public such as the foot and mouth crisis (e.g. Garnefski *et al.*, 2005; Convery *et al.* 2005; Hagar & Haythornwaite, 2005). This example indicates that contrary to the economic focus of Whatmore *et al.*'s (1987a&b) work, emotion occurs in mundane situations that are expected and instrumental to the success of a family farm, such as the export of animals. There is therefore a need for future research into the role of emotions in farming within agricultural geography.

Other products on Fferm Ysgawen were exported to a variety of individuals or institutions within the agri-food system, which included abattoirs and marts. A primary example of this type of product is sheep, which were distributed to three different locations. First, most lambs were sent to slaughter at a local abattoir. During fieldwork, Llew and I made several trips to

the abattoir, dropping off around 30 lambs at a time. At the abattoir, these lambs were slaughtered, butchered and packaged into meat portions sold at the national supermarket Sainsburys. Second, some ewe lambs were not distributed directly into the food chain but auctioned at a regional mart in Cardigan. This was because they were considered good for breeding as they held strong characteristics of the breed including size, sleek face, evenly set legs and maternal instinct. Their characteristics for breeding meant that it was likely that they would attract a higher price as a live animal than meat. Third, some sheep were slaughtered on the farm for home consumption. This was to feed the farm family and was a great source of pride. The sheep were slaughtered and butchered on the farm by a family friend who worked at a local abattoir. In addition to lamb, pigs and turkeys were also slaughtered in this way for home consumption. The family did not consider selling their meat direct to the general public, due to regulations that demand the inspection and branding of meat.

Literature on the industrialisation and productivism of agricultural states that farmers gain the best price by selling in bulk to a single individual or institution within the agri-food system (e.g. Whatmore *et al.*, 1986a&b). Indeed, the family members told me that the supermarket Sainsbury's retails the largest amount of their lambs, which indicates the significance of the industrialised agri-food system to Fferm Ysgawen. However, the farm family members receive the best price for their lambs by selling smaller amounts of them to other recipients. This is decided according to the perceived quality and purpose of the animal. For example, those animals considered good for breeding are sold at a different location to those considered good for meat.

Moreover, holding back some of the meat from the agri-food system to consume on the home farm indicates additional objectives to economic gain or productivism such as saving money, self-sufficiency and enjoying what you produce. These actions provide further evidence of the agency of the farm family and how their decisions fulfil complex motivations.

9.3 The social family farm

Section 9.1 discussed the importance of the community above the other themes to the farm family of Fferm Ysgawen. This scale consists of social engagements with a range of individuals, which include family friends, neighbours, members of the choir and lifeguard station, and other farmers. Socialising with these individuals took various forms from enjoying take-away meals at the home farm, going to outdoor events celebrating music and 'Welsh life', singing at the pub, sharing tea, and competing in the village show. The family were also keen to help organise and promote these events, as they were proud of their rural social life. Llew said once, "they say nothing goes on in the country, but there will be something every weekend over the summer". This section will discuss the impact these social interactions have on farm work undertaken at Fferm Ysgawen. As a result, it looks at how external individuals enter the farm to contribute to its activity and output. More specifically, it will consider how this fits alongside the use of technology on the family farm discussed in Chapter 8.

Jones (1993) argues that prior to World War 1, social interactions were integral to the completion of farm work. This co-operation was most significant

when undertaking large seasonal events such as shearing sheep and baling.

Jones (1993, p.15) writes that

'seasonal work...continued to depend upon a very practical form of neighbourliness. Hay making and lifting the potatoes and shearing and threshing were all highly sociable activities before mechanisation, and the hard slog was shared by the local community moving round each farm in turn till all was done' (Jones, 1993, p.15).

The emergence of the technological treadmill in the years following the Second World War is said to have led to the end of this social co-operation in farm work. As family farmers adopted different technologies and their production became more efficient, they required less additional labour. As Jones (1993, p.29) states, 'with...farm machinery there isn't the same need for co-operation in the farming community'. Furthermore, as this change entailed a loss of social contacts, if help was needed, it was bought in as paid labour. For example, contractors were employed. Jones (1993, p.29) explains that, 'you bring your own paid help as needed, rather than depend on neighbours' (Jones, 1993, p.29).

During fieldwork at Fferm Ysgawen, I was able to observe and participate in significant seasonal events, which offered the opportunity to assess this argument. For example, during sheep shearing, I was assigned the job of folding and wrapping the fleece ready for processing into wool. During hay baling, I helped to carry and arrange the bales for storage until the

winter. The process of cutting, drying, baling and transporting hay has been revolutionised by various types of machinery and technology that were widely adopted as a result of the industrialisation of agriculture. These include mowers, tractor attachments which spin the grass to aid drying, forage harvesters to collect loose grass, and balers for converting the loose grass into bales. Shearing and baling were considered hard work, but they were also eagerly anticipated as they were a sign that the farm was doing well in its production of fleece and hay. It also provided an opportunity for members of the community to come together, share the work load and enjoy each others' company. I was amazed as a mix of family friends, neighbours and other farmers descended on the farm ready to help out. In addition, a local contractor, for whom Dafydd worked, arrived with some of the machinery required (which included a large forager and trailer) and extra labour. There was a clear distribution of work according to age and gender. Men and children completed the work in the fields, whereas the farm women stayed in the main farmhouse to cook (Price, 2004). However, as a student researching farming, I was encouraged to observe and help the men and children. This contravened the distribution of work according to gender that affected everyone else. There was an air of chatter, humour and camaraderie. After several hours, Llew announced that the work had been completed and invited us all, including the contractors, into the farmhouse. We all sat around the kitchen table to enjoy a roast dinner followed by mugs of tea. Cans of cider and lager were also handed around. This provided an opportunity to continue the socialising from the fields, which extended into the telling of old farming stories accompanied with hearty laughter.

Seasonal events such as hay baling at Fferm Ysgawen indicate that while a significant amount of technology is used to carry out these tasks, contrary to Jones' (1993) argument, their completion remains dependent on social co-operation. These occasions also provided opportunities for the family to socialise by sharing stories, laughter and the farm's success. Reflecting Jones' (1993) thesis, contractors were used to assist with seasonal events. However, this was not because social connections had been lost which resulted in a labour deficit, but because the expensive and specialist nature of the technology meant that ownership is not considered necessary at Fferm Ysgawen. As a result, the contractors did not replace, but added to the social co-operation taking place to complete the farm work. They were also key participants in the socialising during the meal and drinks. Dafydd's familiarity with the contractors through his own role in paid farm work enhanced this. Consequently, the distinction between 'paid help' and other local community members is not as clear as Jones (1993) suggests. Rather, there was a mixing or blurring of roles which constituted integration. This indicates even more strongly the significant level of co-operation within the local agricultural community, which is instrumental to the running of Fferm Ysgawen.

9.4 The introduction of new technology through the external connections

Section 9.3 discussed how the community scale has prevailed throughout the introduction of various pieces of technology which were intended to decrease the amount of labour required to undertake farm work. This section considers

how the community and other scales are integral to the decision-making processes that result in the adoption or non-adoption of new forms of technology.

Literature has thus far focused on how particular technologies have led to changes in farming cultures. For example, Tsouvalis *et al.* (2000) write about how the introduction of precision-mapping technology has led to the marginalisation of local non-expert knowledge in favour of specialist technical knowledge. This section will focus on the how the family members of Fferm Ysgawen use their external connections to assist them with decisions about whether to introduce a new form of technology or farm practice.

9.4.1 Genetic modification.

Chapter 8 discussed how providing farm animals with feed containing genetically modified organisms has become standard practice. This meant that this use of genetic modification has not had a significant impact on farmers' knowledge and practice. However, while discussing this situation, Llew was encouraged to recall a situation in the past where he made an active decision to reject animal feed containing genetically modified material. Llew explained that:

“Several years ago, our lambs went to *M&S*⁷, and they didn't want the lambs to be fed with GM feed. This was OK, we checked the feed, and we moved to non-GM. But then they started saying that they wanted the mother and the father of the lambs to be of specific breeds. I saw the breeds, and I didn't like

⁷ Marks and Spencer: A department store that operates around the principle “values of quality, value, service, innovation and trust” (Marks and Spencer Plc, 2014)

them at all. And I didn't want to be dictated by M&S either. You know, give them an inch. [...] So now we sell to *Sainsbury's*⁸ and they don't mind about the feed or the breed.”

This excerpt of conversation indicates that the decision whether to change the use of a technology is related to various scales. First, it relates to Llew's knowledge and perception of 'pedigree' or 'good-looking animals' and what makes a breed and stock aesthetically pleasing (see Grasseni, 2004). This is shaped by cultural ideas on the appearance of animals, which within a farming context are actively defined and distributed by breed societies. Second, it involves the scale of the family farm, where an externally sourced input (animal feed) is used. Third, it connects to the retailers of the national scale. These connections between Fferm Ysgawen and the other scales produce an additional perspective on the family farm's integration within the agri-food system (see section 9.2). The decision to adopt or not adopt animal feed containing GM is dependent on how these scales are connected. Llew was happy to change his use of GM animal feed on the farm scale. However, he was not happy with how this related to change to his personal choice of animal breed (at the individual scale) and the increasingly subsumptive relationship with retailers (from the national scale). As a result of this dissatisfaction, Llew did not continue to use animal feed containing genetically modified material. Therefore, Llew's decision-making surrounding genetic modification and animal feed incorporates other elements of farm practice such as the selection of animal breeds and retailer. However, he is particularly

8 A supermarket centred on the values of “best for food and health...sourcing with integrity...respect for our environment...making a positive difference to our community...a great place to work” (J Sainsbury Plc, 2014)

concerned with preserving his ability to make independent choices and decisions. It is therefore appropriate to consider that the adoption of technologies under 'neo-productivism' may be dependent on the relationship between farmers' and retailers' demands.

9.4.2 Silage pit mats

Section 9.3 discussed the importance of the social connections within the community scale to Fferm Ysgawen, alongside the use of technology and contractors. This section will explore how Fferm Ysgawen draws on this scale for assistance in deciding which forms of new technology to adopt. It will do this through a discussion of the adoption of silage pit mats. Chapter 8 explored the introduction of silage pit mats at Fferm Ysgawen, due to the use of tyres being time consuming and messy. While I was helping to lay the mats on top of the silage, I asked Llew how he had made the decision to adopt them. This excerpt indicates the role of connections between family members to the uptake of technology.

“Well, Hefin had them first and said they were really good and saved a lot of bother. They are expensive, but they save time and the mess. It’s a horrible job using the tyres.”

Llew described Hefin's farm as more productive, business-like and more technologically 'in-tune' compared to Fferm Ysgawen. As a result, Llew respected Hefin's way of farming and his keenness to try new things to improve his productivity. This respect meant that when Hefin found the new

mats successful, Llew trusted that they would work for him too. This example shows the importance of the introduction, trial and recommendation of technology by perceived 'progressive' farmers to more widespread adoption within the social scale.

9.4.3 Farming Connect.

To support the adoption of new farming technologies and practice, a Government scheme known as 'Farming Connect' has been set up by the Welsh Government to operate throughout the country. Farming Connect aims to offer advice and guidance for farmers, financial subsidies for training and technical support, and information about regulatory and industry developments (Welsh Government, 2013a). One of the ways in which Farming Connect offers guidance and training is through a Knowledge Transfer Programme, which is implemented through the organisation of farm visits or demonstration days (Welsh Government, 2013b).

During fieldwork, a number of demonstration days were advertised, which included visits to farms with technologies such as hydroelectric power systems and solar panels. Llew, Dafydd and I attended one of these events which was held at a local farm about 4 miles from Fferm Ysgawen. The event was focused on a project to improve the cattle handling system at a farm a few miles from Fferm Ysgawen. The farm family wanted to make it easier and safer to move large animals with as few farm personnel as possible. The event brought together representatives of Farming Connect, an invited expert on cattle behaviour and local farmers to share their knowledge, advice and guidance. It was hoped that this knowledge would not only improve the

practice at the host farm, but the farms of those attending the event too. After a short talk from the expert on cattle behaviour, the farmers were encouraged to work together in groups to create a plan of the new handling system. This worked well as the farmers were already familiar with each other, having farmed alongside each other for years. We were then asked to share our plans with the whole group, which led to further discussion that included the sharing of experiences from other farms. This continued over a shared lunch, which was provided by Farming Connect and served by members of the host farm. The event was then brought to a close, with the host farmer thanking everyone for their help and providing assurance that the improvements would soon be under way.

The success of the event and particularly the group work is related to the ease of communication that arose between the farmers because they were already familiar with each other. Farming alongside one another meant that they may have stopped to chat in the town, socialised at a local carnival or helped each other with seasonal work (see section 9.3). These social connections are embedded within the community scale of Fferm Ysgawen. Section 9.4 argued that this scale is very important to the adoption of new technology. Farming Connect builds on this to focus interactions on discussing, improving and introducing new farming practice and technology. In this respect, it recognises the knowledge, experience and expertise of farmers. As a result, it gives the farmers confidence in the value of their knowledge and experience and the encouragement to share it with others. This relates to the work by Sutherland and Burton (2011) on the relationship between farmers' social or cultural capital and technology. Consequently, it

can be argued that the success of Government initiatives to introduce technology is dependent on their acknowledgement of farmers' knowledge and the way this is shared, predominantly through the community scale.

9.5 Rejection and changes to external connections over time

Research on the external connections of farmers has begun to consider how they change over time. For example, Holloway and Morris (2008) discuss how the introduction of new technologies has resulted in change to the connection between technicians and farmers as the knowledge of the former gains importance. However, there remains scope to investigate how farmers themselves alter their connections through processes of selection, rejection and creation. The theorist Mol (2000) describes how these processes are significant for patients with atherosclerosis as they change their understanding of their illness according to different sources of knowledge such as their physical symptoms, discussions with medical professionals and images like x-rays. There is therefore significant scope for agricultural geographers to explore how farm families modify their range of external connections. This section will explore these processes within the farm family context of Fferm Ysgawen. A willingness to react and modify the practices on the family farm according to changing circumstances has already been highlighted as important to survival (see Chapter 3 & 7)

Section 9.5 discussed the importance of the Government scheme Farming Connect as a way for the family farm members to find information about new technology and practice. However, Farming Connect is not the only initiative run by the Welsh Government to provide information for farmers.

Another example is the publication called 'Gwlad'. Gwlad is a free magazine distributed once every two months to farmers through the post and is also available online. It contains a range of information on agricultural news and affairs, some of which is concerned with the introduction of new technology. However, Gwlad was not popular with the family members of Fferm Ysgawen. Llew thought that it was too focused on 'experts', policy and regulation, which left little room for "real farming". Dafydd said that this was echoed in the style of writing, "the Welsh is too formal". As a result, the publication was left unread by the farm family but sometimes passed to me as "it might be good for the PhD" (Llew). It is clear that Llew and Dafydd did not feel that the information or writing style within Gwlad resonated with farmers' perspectives and practical experience of farming. Consequently, the publication did not reflect the face-to-face communication of the practical or 'non-certified' knowledge of farmers, which is common to the interactions already established within the community scale (Collins & Evans, 2002). As a result, other forms of knowledge transfer, which did echo the established knowledge culture such as Farming Connect (see section 9.4) were selected, while Gwlad was left discarded.

This chapter has highlighted the variety of connections of Fferm Ysgawen and, in particular, the importance and strength of the connections within the community scale (e.g. sections 9.1, 9.4). However, some connections within the social scale were changed substantially. Over the course of fieldwork, this type of significant event occurred just once. During one of the very first days spent at on the farm, I was introduced to a family friend who farmed some land close by. This close proximity meant that the

friend visited Fferm Ysgawen most days to socialise and offer farm help or guidance. For example, one day he helped us with herding and guiding the sheep through the race, so that Llew could concentrate on trimming and treating their hooves. After the work was completed, we went into the farmhouse for a cup of tea and a chat (cf. Chapter 7). However, some weeks later, the family friend's cows escaped from their holdings twice. On both occasions Llew and Dafydd herded the cows back to the farm, but on the second Dafydd received an injury to his back in the process. Llew became very angry about this situation for two reasons. First, Llew felt that letting your livestock escape from their holdings was not good, responsible farming practice. Second, he was very upset that his father-in-law had been physically hurt. As a result of this situation and its repercussions, Llew firmly expressed his feelings to the family friend and cut all contact. Consequently, the connection that enabled the transfer of farm help, advice and knowledge was severed. This example indicates that while the rejection of connections within the community scale did occur, their rarity and significance meant that they attracted a high level of attention and emotion.

The family members of Fferm Ysgawen also forged new connections. One of the key ways in which this took place during fieldwork was through myself, as the student researcher. As part of the process of investigating the connections of the family farm, I was introduced to individuals, forms of knowledge and types of practice that were unknown to Fferm Ysgawen. On one occasion, I had a discussion with one of their family friends who was undertaking some work in the farmhouse as an IT technician. While fixing the family's computer, we chatted about how some farmers were using IT to run

and manage their farms. Following this discussion, he invited me to accompany him when he visited a farm which he considered to have a significant amount of technology. The farm was primarily focused on dairy farming, but also did some contracting and gritting work in the winter. They had recently invested in new technology such as artificial insemination using sexed semen (to produce females only), a calf feeder and cow collars. These collars are used to hold a range of data relating to the cows physiological condition and behaviour. For example, they can detect from physical movements when cows are at their most fertile, ill or non-productive. The reasoning behind this investment was focused on changes to agriculture that the farmers were anticipating such as fluctuating prices, changes to environmental subsidies and the need to be increasingly productive. Interestingly, this reflects changes to the agricultural sector that are envisaged under neo-productivism (see Chapter 2). The family had already had experience of these difficult challenges, saying that price changes meant that “you don't know where you are half the time”. On my return to Fferm Ysgawen, I described to Llew how the family farm I visited had looked to invest in technology to prepare for the future. Llew showed a great deal of interest in this, as he described how he was also looking to make preparations for the future (see Chapter 7). This discussion about the two family farms and their similar plans for the future constituted a transfer of knowledge, due to the connection that I created between the family farm I visited, the IT technician and Fferm Ysgawen. It also transpired from my account of the visit that Fferm Ysgawen did know of the farm through their gritting work, so it may be

possible that this connection retained its significance beyond the completion of fieldwork.

9.6 External connections and the survival of the family farm

This chapter has explored how the farm family members of Fferm Ysgawen used their autonomy and agency to create, maintain and reject connections with individuals and entities beyond the family farm. Mapping these engagements revealed an extensive range and diversity that spread across the farm family's rural environment. Focusing in on the relationship between the family farm and the agri-food system revealed that there were many organisations concerned with providing or receiving inputs and outputs. This observation can be used to critique linear conceptualisations of family farms within the agri-food system such as food chains.

These connections were based on motivations such as sustaining the family (e.g. providing meat for the table through home slaughter), contributing to the farming community and maintaining independence. This chapter has revealed clearly the importance of non-agricultural social or leisure connections to the farm family. This has endured despite the introduction of new forms of agricultural technology, which have decreased the need for additional labour. This use of technology alongside external connections creates a powerful mechanism for the survival of the family farm, because it appeals to the central motivations of the farm family (see Chapter 7) to produce and maintain a good way of life. Moreover, efforts by the Welsh Government to introduce technology or change farming practice using already established external connections within the farming community, indicates that

this combination will be useful in the implementation of future agricultural change (e.g. neo-productivism). Moreover, concern with the preservation of independence and choice on the family farm (e.g. selling lambs to a particular organisation to preserve the chosen farm breed) suggest that they too are concerned with protecting their resilience within a changing agri-food sector. These factors contribute to a longing for survival and for retaining the family name on the land.

CHAPTER 10: CONCLUSION

This research has made significant contributions to research on the 'family farm' and agricultural change in the UK, particularly for perspectives offered by the sub-discipline of agricultural geography and related areas such as rural geography and social sciences. These contributions include empirical and theoretical insights which are centred on how the farm family used tools to fulfil a central goal of persistence and survival. This was achieved through comprehensive implementation of ethnography, which in itself takes forward the methodological frameworks that have been used thus far within agricultural geography. These contributions have enabled the thesis to help create an explanation of why the farm family has survived throughout periods of agricultural change since the Second World War.

This conclusion will reflect on these contributions and discuss their potential in taking forward future research within agricultural geography and related disciplines. It is split into three sections. Section 1 will consider the knowledge that this thesis has created about the family farm and the potential for a new conceptualisation of it. The second section will offer a detailed account of the application of ethnography in this study and how it has taken forward previous studies. It will also explore the limitations and advantages of this method in order to guide future research. Finally, section 3 will use the explanation of the survival of the family farm established in this thesis to consider whether they may persist under anticipated future agricultural change. It will also explore how this impacts conceptualisations of neo-productivist agricultural change.

10.1 Contributions to understandings of the family farm

This research focused wholeheartedly on the family farm within the UK. This fulfilled potential to critique and move beyond top-down economic theses of post-war agriculture, which argued that the inability of the family farm to access technology and external funding would result in their demise and a takeover by large corporate enterprises (see Cochrane, 1958; Dexter, 1977; Marsden *et al.*, 1989). It also challenged perspectives that family farmers have survived by decreasing or ceasing their production of food and introducing other activities such as organic agriculture or tourist enterprises (Evans & Ilbery, 1992). Rather, the research acknowledged the actual presence and significance of the productive farm family together with its interactions with technology and external entities.

Consequently, the study mobilised novel approaches to explore the farm family and these areas of interaction, to reveal the reasons behind its survival. These approaches centred on a theoretical framework which drew on bottom-up perspectives established as part of the cultural turn in geography and applied to agriculture (Morris & Evans, 2004), which prioritise every day and mundane practices. This was achieved through an application of the method of ethnography (see section 10.2). Analysis of the research material led to the creation of three results chapters, which revealed detailed and rich insights into the farm family and their engagements with technology and external entities.

This section of the conclusion is about identifying important dimensions of the family farm that emerged as transgressive across some, if not all, of these chapters. There are three dimensions in total. Sub-section 10.1.1 will

discuss creativity and surprise on the family farm and 10.1.2 will explore how the concept of 'family farming' was ingrained at Fferm Ysgawen. Finally, sub-section 10.1.3 will discuss contentment at the family farm. These sub-sections will be drawn together in 10.1.4 in order to consider how they may be used to begin a re-conceptualisation of the family farm in the UK.

10.1.1 Creativity and surprise on the family farm

Agricultural geographers such as Evans (2009), Lobley and Potter (2004) and Meert *et al.* (2005) have discussed the presence of decision-making and survival strategies on family farms. The study highlighted some evidence of strategies on Fferm Ysgawen that led to the introduction of specific activities and enterprises. For example, Chapter 7 described that when Dafydd and Rhiannon managed the family farm, the 'motto' was "don't put all your eggs in one basket" which led to them producing livestock, crops and engaging in diversification activities. She explained that later 'mottos' recommended specialisation and a focus on a small number of activities. However, rather than originating from the family farmers themselves, these messages were communicated through policy-driven publications that were distributed within the agricultural community. Chapter 3 subsequently argued that the concept of a strategy within the literature was too prescriptive, neglected non-economic motivations and did not adequately reflect the decisions and perspectives of family farmers themselves. The results chapters provided further empirical evidence to support this critique, because they each revealed instances or events at Fferm Ysgawen which were entirely unpredicted and

instigated surprise amongst the farmers themselves, which meant that even the most articulate and detailed strategy could not explain them.

Chapter 7 discussed how Llew had begun to increase his beef herd by purchasing male dairy calves from his fellow family farmer and friend, Hefin. This is unusual because male dairy calves are not considered to hold much meat because the breed is specialised in milk production. As milk production is obviously not viable for males, the calves can be slaughtered and processed into low grade meat products, exported for veal production or culled at birth. The relatively small amounts of profit generated by these outputs means that I did not expect Llew to tell me that he began to purchase male dairy calves in order to establish a beef herd over a period of several years. He explained that this was because while bull beef cattle generate a relatively large amount of profit they require a significant investment to purchase, whereas beginning a herd of male dairy calves requires little initial finance but still acquires an albeit smaller but steadily increase amount of value over time. This example indicates that Llew is able to see beyond the expected outcome for a particular animal to create an innovative income for the family farm. This ability was also highlighted in Chapter 8 when some uses of technology were described as surprising. A key example was the use of the slurry tanker not for its intended purposes, but to store water which was then sprayed over a barn to clean it. Discussion with Llew indicated that I was more surprised by this than him, because he considered this innovation to show an ability to modify and repair that he considered to be essential for any farmer. Finally, Chapter 9 emphasised that while the farm had external connections that extended nationally (and some even globally), which enabled

them to 'shop around' for the lowest price for inputs and the highest for outputs, they preferred to maintain those within their local community. The actions and practices described here indicate that family farmers make decisions and undertake actions that are sometimes completely unpredictable. Section 10.2 will argue that it is highly unlikely that the family farmers would have discussed these during a one-off visit by a researcher to carry out a method such as a questionnaire or interview. Rather, being aware of these unpredictable instances is dependent upon a comprehensive ethnographic approach. Observing these actions is very important because they show that family farmers are innovative, creative and able to think 'outside of the box'. These elements of the personality and ability of family farmers have only been captured partially by some work guided by a behavioural approach (see Ilbery, 1985, Burton) so there is a need for detailed exploration.

These examples are also surprising because as well as not following a strategy or direction in agricultural policy, they also do not reflect the motivations of family farmers themselves which are discussed prominently within the literature. Chapter 2 explained that analysts of agricultural change in the postwar era assert that successful farmers are overwhelmingly concerned with economic gain. They argue that these farmers will invest in tools that produce the largest amount of profit in the quickest way possible. In contrast, the family farmers at Fferm Ysgawen were concerned with generating profit which would continue to increase steadily over a number of years, perhaps even long enough to enable future generations to also benefit from it. This was created not by purchasing prolific beef cattle or every form of

new technology on the market, but by rearing a herd over time and by modifying current tools and equipment to perform alternative functions. In addition, the family farm made necessary purchases within the local community even if it meant paying more, because they considered suppliers located close to the farm to be accountable, familiar and trustworthy. They thought that this made it more likely that in the event of a problem they would receive support such as advice, a refund or help with uncompleted farm work. These motivations to create long-lasting profit, make conservative purchases and maintain accountable connections show clearly that farmers are not solely concerned with immediate financial gain. Rather, they are very much concerned with the long-term sustainability and survival of the family farm. The importance of the long-term view of family farmers has previously been underemphasised. Recognition of it here adds a sense of robustness and endurance to this study.

Agricultural geographers inspired by the cultural turn have already begun to identify some non-economic motivations within farming (see Chapter 3) and this work requires greater recognition in order to challenge the prominence of economic perspectives. This study has supported this process by providing detailed illustrations of surprising actions undertaken by family farmers which have not previously been recorded. This was achieved through a potent combination of theory guided by the cultural turn which prioritises action and practice, and an ethnographic approach. Therefore, there is significant potential for this to be applied within future research.

10.1.2 Family farming from the cradle to the grave.

Literature within agricultural and rural geography has explored the significance of being a family farm member to different phases of an individual's life. The phases of childhood, marriage and retirement have emerged as particularly important. This is because the management of these life phases is related to the maintenance of the patriarchal way of life of family farming (Price & Evans 2009; Price & Conn, 2012). During the time at which fieldwork took place, the farm family members of Fferm Ysgawen were negotiating two of these phases of life: childhood and retirement.

Chapter 7 discussed the upbringing of the farm family children Angharad and Cerys. Capturing the perspectives of children on their family farm life and work has already received some interest. For example, Riley (2009) discusses how children construct their identities according to the discourses and perceptions of life on a family farm. This study offered some additional perspectives on the identities, lives and expectations of the children from the point of view of their parents and school mates. For example, Llew and Bethan explained how each of the children had remarkably different characters. They described Angharad as being quiet and appreciating her own company, enjoying being outside and having a natural connection with animals. In contrast, Cerys was described as talkative, sociable with her friends from school and keen to participate in off-farm activities. Llew and Bethan connected these characteristics to the different aspects of their children's current and future life. For example, Angharad was assigned significant responsibility on the family farm such as checking and feeding the animals after school because, as Bethan remarked, she is "so going to be

farmer” (Bethan). In contrast, Cerys was encouraged to participate in activities such as the singing with the local choir and participating in the Eisteddfod (activities which were considered to uphold the Welsh family farming way of life) because it was considered less likely that she would want to be involved in practical farming in the future. This identification of the children with the family farm was also evident in school, as Chapter 7 described how fellow pupils called them “ham bones” (a derogative term spoken in the English language derived from the connection between ham, pigs and farm for ‘farmer’) rather than “townies” (a term for children who live in a town) to denote their habitation of a family farm. This is an interesting comparison to the children Riley (2009, p.252) observed who cited the nicknames “country bumpkin” and “stinky farm kid”. These examples illustrate how children on a farm family may be identified and perceived by those from outside of it. Moreover, they also show how these identities lead to farm family children being imbued with expectations and ambitions that can significantly determine their present life. This includes the activities that they carry out on a day-to-day basis, their hobbies and interests. It is also reasonable to expect that this will impact their future in terms of, for example, their studies, employment and living arrangements.

Retirement has received interest as the point at which the family farm is succeeded and control or management is transferred to the next generation (Lobley *et al.*, 2010). Fieldwork at Fferm Ysgawen revealed that retirement and succession is not a fixed point in time, but a process (cf. Riley, 2011). Indeed, the retirement of Dafydd and Rhiannon was actually their 'semi-retirement' as they still completed work which contributed to the agricultural or

family life of Fferm Ysgawen. For example, they travelled to the family farm every day to undertake a variety of activities such as looking after the children or tidying up the yard. In addition, Dafydd in particular found it impossible not to refer to himself as 'a family farmer'. This example indicates clearly the persuasive and enduring nature of the identities associated with family farming. As a result, while Dafydd and Rhiannon did not live at the main farmhouse or have involvement in management, they retained significant roles and a home on the farmland.

This sub-section has explored childhood and retirement on Fferm Ysgawen. In both cases, the individuals concerned have important identities, roles and tasks that are inherently related to the family farm. However, the fact that the children and Rhiannon were female indicate that this is not purely to fulfil a patriarchal way of life. Rather, as discussed in Chapter 7, different tasks seemed to be undertaken largely voluntarily according to individuals' skills, characteristics and personality. For example, Angharad's introverted character and 'instinct' with animals led to her completing more practical, farm-based tasks. As a result, the family farm seemed to have a selection of individuals working as easily as if they were cogs in a very oiled machine. There was a clear connection between this designation of work and the motivation to maintain their way of life and ensure the survival of the family farm.

10.1.3 Contentment on the family farm

The family farm can be considered to be at the centre of notions of the 'rural idyll', which is a term used to describe how natural, unpolluted and relaxed the

countryside environment is compared to the urban (see Bell, 2006). This notion may be critiqued for not capturing adequately the reality of agricultural life, which often includes hard manual labour, long hours and relatively little pay. Indeed, researchers have highlighted that farming can be a great source of stress. For example, Price and Evans (2009, p.1) argue that 'future research agendas need to be based firmly on the distressing reality of patriarchal family farming' Consequently, it was interesting and pertinent to observe the emotions and feelings that emerged during fieldwork at Fferm Ysgawen.

It was clear that Fferm Ysgawen had its own challenges that occasionally came to the fore, particularly when tricky decisions had to be made. For example, Chapter 7 and Chapter 9 explored the introduction of new technology and livestock to the farm in the form of silage pit mats and a bull. Both these decisions took a significant length of time as the farm family undertook a complex process which involved research, solicitation of the opinions and perspectives of friends, consideration of the fulfilment of their motivations (e.g. the silage pit mats would make life easier), allocation of funds, and a view of the possible benefits to the future generation. These multiple areas of concern meant that making such decisions involved a great deal of thought and tribulation. However, Chapter 9 revealed that the most stressful and upsetting instance during fieldwork was an accident involving an escaped animal and Dafydd, and the fall-out with a neighbouring farmer and friend that resulted. This led to the only instance when an external connection of the family farm was dissolved.

Considering these examples and the academic work on rural and farming stress, it was interesting to note very few instances of real discontentment. This is surprising because it appeared to me that there were sacrifices such as skipping holidays and undertaking part-time off-farm work to ensure that the family farm continued to be successful. There was also the issue of tiredness and occasional aches and pains as the manual work took effect. For the most part, the activities and tasks required on the family farm were completed with no question and seemingly little planning. For example, despite the significant number of tasks that were required to be done in a day, the only list of jobs that was ever made was for me. It was as if the farm family worked purely instinctively. This was particularly apparent when observing the children, as Chapter 7 described how they completed chores and errands such as washing-up, making cups of tea for guests and tending animals, not just without complaint, but without even being asked. Some of the farm tasks required very long hours such as lambing and hay baling (e.g. Chapter 9 described the occasion when Llew and I worked into the evening to complete hay baling), but they were still considered to be some of the most rewarding tasks on the farm. There is a clear reason for this. Everyday tasks were carried out so instinctively and without much real thought or planning that they were easily forgotten or missed. In contrast, these large seasonal tasks allowed for reflection on the direction and achievement of the family farm. For example, they enabled consideration of how the livestock numbers were increasing, an appreciation of spending time outside with friends, and of how the farm was developing in preparation for succession by the next generation.

Both the instinctive and the planned activities were key to the successful running of the farm.

Despite significant literature on feelings of resentment and stress within family farming, the members of Fferm Ysgawen could be described as extremely content. For the most part, they are able to manage the negative elements of family farming so that they preserve a way of life that provides great satisfaction and enjoyment to them. It can therefore be considered that they actively protect and maintain their own notion of farming within their own positive construction of the rural idyll. This also offers an interesting point for conceptualisations of the rural idyll, because it shows that they are not only relevant for outsiders looking in (which has been the most prominent perspective in the literature) but for individuals who have lived and worked in the rural environment for some considerable time.

10.1.4 Towards a re-conceptualisation of the family farm.

This section of the conclusion has explored three themes which transgress the three results chapters. These are creativity and surprise on the family farm, the presence of family farming in the life phases of childhood and retirement, and contentment. This study did not aim to define the family farm, but to explore the reasons behind its survival throughout periods of agricultural change since the Second World War. However, the emergence of these themes and their contribution to knowledge within agricultural geography means that it is pertinent now to assess how they may provide a catalyst for a process of re-conceptualising the family farm.

The definition of the family farm produced by Gasson and Errington (1993) was critiqued for its lack of attention to process, fluidity and variety. Consequently, Chapter 3 advocated an exploration of the everyday practices on the family farm, prior to an extrapolation of their internal dynamics. In turn, this section of the conclusion has identified themes which transgress these internal dynamics of family farming. In seeking to develop the conceptual framework of this study in order to theorise these themes, it is useful to consider work which appreciates the complexity and intricacy of human life and engagements. Some geographers have advocated looking beyond the boundaries between the natural, technological and social. For example, Whatmore (2002) argues that we should not distinguish between the social and the natural but understand phenomena as hybrids created through relations between them. Whatmore (2002) has applied this approach to identify a number of hybrids from genetic modification technology to elephants in a zoo. Therefore, there is scope to consider how elements of the natural world may be useful to understanding the themes that emerged during the fieldwork on Fferm Ysgawen. The honey bee hive has emerged as useful because elements of its activity and organisation indicate surprise, embedded identities or roles and contentment.

The honey bee hive is a complex and fascinating collection of thousands of insects. The popular notion that a queen bee acts as a leader or manager of the hive is untrue (Seeley, 2010). Rather, bees identified as queens, drones and workers undertake different roles in order to work collaboratively to reproduce and survive. The queen bee is responsible for laying eggs, drones are tasked with locating sources of pollen or new housing

sites and workers tend for the developing eggs and fill the combs with honey. Roles are attributed to bees according to the needs of their hive, which is implemented by treating the eggs differently during the laying and gestation period. A male bee (drone) is created by the application of sperm held in a sac on the body of the queen bee (see Seeley 2010 for more detail). A female bee will become a worker if the egg is laid in a cell within the honeycomb, or a queen if laid in a tall free form cell produced on the edge of a comb. As such, the role adopted by each bee is pre-destined prior to hatching. In addition, the roles attributed to bees do not undergo change throughout their lifetime. The life expectancy of a bee is also different according to their role (for example, female workers live longer than male drones). This enables bees to create the elements of the hive that they require through the laying process. This is akin to the description in sub-section 10.1.2 of the association of individual members with particular roles during childhood, which address the wider needs and requirements of the family farm. Once embedded, these roles resonate throughout their lifetime and the potential for losing them to retire presents great personal difficulties.

Despite the clear aims and roles present in the honey bee hive, it does undergo sudden large-scale change which seems astounding. Swarming is a process whereby a new queen bee hatches and several thousand workers and drones leave the hive with her (Seeley, 2010). The group of several thousand bees may be sited several metres from the hive formed in a beard-like shape suspended from items such as trees, lamp posts or hanging baskets. In an area undisturbed by the human population, after a period of a few hours to some days, the swarm will depart by its own accord to a

permanent home. Where in the proximity of humans, the amazing visual sight and audible noise of such as mass of insects and the possibility of harm being caused by bee stings will likely instigate contact with a bee keeper who will transfer them skilfully into an artificially-created hive. Despite this strong reaction by humans, swarming is integral to the hive because it allows it to grow and reproduce. This account shows some similarity to the discussion in sub-section 10.1.1 of the events at Fferm Ysgawen which seemed unpredictable and unexpected, but were instrumental in fulfilling motivations such as conserving farm resources that contributed to upholding the overall aim of survival.

The honey bee hive can experience stress and agitation. Overpopulation is one of the worst threats to an established hive as running out of space for storing honey will mean that there is insufficient food for the winter. The presence of too many bees in the hive also means that the pheromone chemicals they release to communicate with each other become so diffused that they are meaningless. For example, without communication from the queen, it will be unclear whether she requires the production of a new queen cell for another queen or cells within the honeycomb for more workers which could result in a waste of precious energy. These stressful situations are managed and averted by intricate decision-making processes, which prepare some of the bees to swarm and establish a new hive. Seeley (2010) describes in detail that overpopulation signals to the drones that they must begin to search for new hive sites. Each drone then presents a range of sites to the others, from which a process of selection occurs. Seeley (2010, p.101) describes that 'a honeybee swarm pursues an unusually sophisticated

strategy of decision making'. Seeley (2010, p.118) states that this is 'democratic'. As discussed previously, swarming is instrumental to the survival of the bee hive. This enables the bee hive to remain satisfied and content during times of great unease. This reflects clearly on the ability of the family farm to deal with stress and unease through effective communication and decision-making. More specifically, it also indicates the importance of working towards the clear aim of continuation and survival, and ensuring that each family member has a voice which can be heard. However, what is particularly interesting is that while the honey bee hive persists by swarming to another site to establish a new home, the farm families' consubstantial (Gray, 1998) relationship to land means that this is not possible. Consequently, the family farm must work harder to reproduce of the family farm as part of succession across generations within its own boundary. To illustrate, Chapter 7 explored how reproduction of the family farm can be seen when some members move to another property on the farmland at the point of succession. Another example might be the acquirement of more land perhaps through farm amalgamation, which enables different enterprises or even farms to take place on land owned by the same family.

Seeley (2010, p. 25) writes that the elements of a honey bee hive described here means that it is useful to think about it 'as a single living entity that functions as a unified whole [...] [or] as a superorganism'. This organisation of individuals in a type of co-operative has been cited as useful for conceptualising some of the relationships within organisations in human society. For example, Ratneiks (2001, 2002) has utilised the honey bee hive to theorise oil companies and supermarkets. Other scholars such as Seeley

(2010) have taken this further by arguing that human society has much to learn from honey bees such as how to undertake democratic decision-making processes. However, this sub-section has indicated very clearly that while there may be significant differences between a honey bee hive and a farm family, there are areas which clearly resonate. Moreover, certain processes of a honey bee hive such as swarming which would not been possible if they held a consubstantial relationship with land, really emphasise some of the complex and profound workings of a farm family. As a result, the honey bee hive forms a productive and thought-provoking set of principals which are relevant and useful to thinking about the farm family. In addition, following the arguments of Seeley (2010) and Ratneiks (2001, 2002) that advocate humans learning from honey bees, it could be considered that reflection on the practices, roles and organisation of family farm members could enable more effective forms of organising individuals in other realms of society.

10.2 The methodological contribution of ethnography

Agricultural geography has been characterised by quantitative and objective methods such as surveys and questionnaires. These methods seek to produce data which are representative of a large proportion of the agricultural sector (Walford, 2002). Such data were used to, for example, categorise different farming types, quantify farming outputs or analyse broad agricultural change. Recommendations based on this information were guided towards policy-makers with the responsibility of agricultural political structures. The emergence of the cultural turn led to a recognition that agricultural geographers needed to re-think their methodological tools in order to reveal

in-depth knowledge about the behaviour, knowledge and practices of farmers. As part of this, the implementation of ethnography has been advocated strongly (see Morris and Evans, 2004; Hughes *et al.*, 2000). Despite this, prior to the completion of this study, comprehensive implementation had not taken place within the sub-discipline. However, ethnography had inspired some studies, which have developed the prevalent methodological approaches of the sub-discipline in two ways:

i) Decrease in sampling size: The first type of application is a decrease in the number of farms or participants involved in studies. For example, Pile's (1990) work on farmer's understandings of newly introduced milk quotas focused on 6 farms.

ii) Use of individual methods associated with ethnography: Agricultural geographers have become increasingly interested in methods that may be considered to be linked to ethnography. For example, Bennett's (2004) research into patriarchy in mining and family farming utilised the methods of participant observation (including undertaking voluntary work), interviewing and the completion of a fieldwork diary. This research constitutes a partial application because Bennett did not stay with participants, but in a bed and breakfast. Other examples of the use of methods associated with ethnography is Evans' (2013) application of open-ended interviewing guided primarily by the participants, Riley's (2010, 2014) implementation of collaborative and in-situ interviewing, and the repeat visits carried out by Price and Evans' (2009).

This study is the first comprehensive implementation of ethnography within the sub-discipline of agricultural geography. As a result, it constitutes a whole new direction for the methodological frameworks familiar to agricultural geographers. The remainder of this section of the conclusion will explore this implementation in detail, including the advantages and limitations, to reflect on how it has taken forward the studies that partially applied this methodology. This account will draw together the detailed working example of how ethnography may be practically used within the context of a family farm emerging from this thesis. This will be of particular interest to rural and agricultural geographers seeking to fulfil the potential to implement further ethnography. This discussion will be split into two sections. The first will explore the focus of this thesis on one family farm. The second will discuss elements of the ethnographic approach that are missing from the literature, but emerged as significant through the full application in this study, such as living in the field for a long period of time.

10.2.1 Focus on a single family farm

This study sought to extend the work of agricultural geographers who were beginning to realise the merits of focusing on fewer farms or participants in order to create richer, deeper and more meaningful research material. The first two objectives of this study aligned with this research direction as they were concerned with the family farm's internal dynamics and engagements with technology. Moreover, the fulfilment of these objectives was underpinned by a theoretical framework (see Chapter 3) which prioritised the knowledge-practices, motivations and ingrained objectives of family farmers. As such, the

decision was made to focus on a single family farm. This has offered a key contribution to agricultural geography. The literature review stated that some agricultural and political geographers consider the family farm to constitute one of the smallest enterprises within the agricultural sector. As such, this study has applied ethnography in the most concentrated and immersive way possible within the sub-discipline.

However, the study was also mindful that this application of ethnography could be critiqued strongly. Restricting the implementation of methods to a single family farm could neglect the presence of connections beyond the farm gate and thereby lead to a limited, bounded and unreal portrayal. Moreover, its location in a county of Wales characterised by particular farming types, agricultural traditions and way of life means that the study may be considered unrepresentative of other family farms and agricultural enterprises in the UK. For example, the distinctive nature of the way of life at Fferm Ysgawen and nearby family farms may not be useful for theorising either agribusinesses significant in Cambridgeshire or hobby farms in Devon. These criticisms are partly mitigated by the wealth of research already described that has already established understandings of the general agricultural sector. However, the thesis directly engaged with them in two ways. First, the scope of this thesis was made very clear through the devotion of a chapter to discussing the study area. Second, the study introduced a modified form of ethnography from social anthropology known as multi-sited ethnography. This was instrumental to fulfilling the third objective of the study: to explore the external connections of the family farm. This implementation has made a highly significant contribution by introducing multi-sited ethnography to agricultural geography.

The focus of this methodology on connections that radiate from a single source has a clear affinity with family farming due to their relationships within the agri-food system, so there is clear potential for it to be utilised in future research. However, its theoretical underpinning which puts appreciation on the pathways carved through the landscape by the movement of individuals indicates that it may be appealing for human geographers concerned with many manifestations of the relationship between people and place.

10.2.2 Reflections on ethnography

This study sought to build on the application of methods associated with ethnography by some agricultural geographers through implementing the whole methodological framework. In addition to a focus on a single family farm, the implementation involved the researcher living and working there for 6 months. This allowed for immersion into the fieldwork context, which is a central characteristic of ethnographic work. Alongside this, the researcher undertook participant observation, interviewing, focused discussions and the maintenance of a fieldwork diary. The use of these multiple methods allowed for deep engagement with the fieldwork context which captured both the general life on a family farm and more specific opinions and practices centred on, for example, genetic modification or the future of agriculture. As previously discussed, this implementation of ethnography is the most profound to occur in agricultural geography thus far and so the detail in Chapter 4 and the summary offered here offers clear direction and benchmarks for researchers considered a similar methodological approach. More specifically, this implementation of ethnography and multi-sited ethnography led to the

emergence of some methodological elements that had not previously been observed or discussed within the sub-discipline. These elements include specific contributions, challenges and critical reflections. This is because the application of single methods associated with ethnographic (e.g. participant observation) did not establish the same immersive conditions that enable these elements to come to the fore. This sub-section will discuss two key elements that emerged: i) living on and ii) exiting the family farm.

i) Living on the family farm.

Ethnography is defined by the requirement to live and work with participants. In this study, I did this at Fferm Ysgawen for a period of 6 months. This allowed me to participate in work activities, take responsibility for particular tasks and conduct specific methods such as focused discussions. In addition, it also allowed me to socialise with the farm family members through activities such as watching television, visiting the pub or going shopping. This led to important insights into family farming which were not only concerned with agricultural practices, but incorporated the whole way of life.

Over time, this level of involvement led to the establishment of trust and openness between the participants and I. This enabled me to view aspects of family farming that would have remained hidden if an alternative methodology had been used. For example, it is unlikely that any questionnaire asking about technology would have captured converting the slurry tanker into a water carrier and so uncovered this unintended function. This is because, as discussed in Chapter 7, the family farmers did not perceive themselves to use many pieces of technology so they might have referred the researcher to

another farm (similarly to how they described Hefin's farm to me when I asked about technology in the early days of fieldwork). Moreover, as discussed in sub-section 10.1.1, Llew did not consider this particular modification of the tanker surprising but part of the normal ability and proficiency of a family farmer so they may have tried to think about uses that they considered more 'special' or 'unusual'. Consequently, compared to methods such as 'one-off' interviews or questionnaires, ethnography is the optimum tool for revealing instances that participants might take for granted or undertake subconsciously, and feelings or motivations that are deeply ingrained. However, this level of research engagement means that ethnography is dependent on a significant amount of personal commitment. Living with participants for a long period of time can be very challenging to balance with the personal, work/study and social life of the researcher. There is potential for researchers to struggle with homesickness, cultural shock and 'burn out' as a result of feeling that they are working continuously. During the fieldwork for this study, I undertook a range of activities to avoid these potential impacts such as using the time and personal space afforded by completing errands for the farm family (e.g. going shopping for food or posting a letter) for reflection and recuperation. I also occasionally visited my home to progress with writing (which helped me to remember the aims and objectives whilst in the midst of ethnographic detail) and to have a break. This helped me to remember the study aims and objectives, which enabled me to maintain perspective on the detailed material that was emerging through fieldwork. These activities are highly recommended for researchers looking to undertake ethnographic fieldwork.

ii) Exiting the field

The intense engagements with participants over a long period time also means that consideration must be given on how to cease fieldwork and exit the study area. Chapter 4 stated that the methodological approach adopted in this study was envisaged in three phases: entry into the field, fieldwork and exiting. The strategy for exiting the field centred on maintaining communication between the participants and I after the formal phase of fieldwork has ceased. This followed the approach commonly used by social anthropologists who consider that to end all communication with participants at a set point, even if this is clearly set-out at the beginning of the study, is unethically to 'cut-off' or abandon the connections that have gradually built up over time (see Ellis, 1995). The sudden diminishment of contact with a researcher, particularly one that has taken an active role that offers help or assistance (e.g. taking on work on the farm or in the farmhouse) or has utilised methods which require significant openness and honesty, can leave participants feeling a sense of difficulty and even loss. Moreover, being involved in research can have repercussions for participants, such as increased reflection about the direction and success of their day-to-day activities. In addition, for the researcher, events or occurrences can occur outside of the formal phase of fieldwork which are of great interest to the study. This provides strong justification for maintaining contact with participants after fieldwork has ceased. Within this study, communication with Fferm Ysgawen extended through brief follow-up visits lasting several days, telephone calls and text messaging. The information relayed during these

opportunities provided some very useful additional research material. For example, we discussed future phases of the study such as the write-up of the fieldwork material, seasonal events not observed during fieldwork (e.g. lambing) and changes such as the introduction of further technology. This material contributed further to my knowledge and assisted the formulation of arguments in the thesis. For participants, it was possible to share any thoughts or concerns that were sparked by instances during fieldwork. For example, we discussed over the phone how the family farm might or might not adjust according to the possibility of neo-productivist change that I described in some of the focused discussions. As the study progressed, this contact and the information that resulted from it gradually decreased in a way that was unforced, respectful and natural. This account of exiting the field after ethnographic engagement is the first such reflection in agricultural geography. However, it indicates that it is an intricate process which requires serious consideration and concern. It has offered the approach used in this study as a working example, which involved composing a 'draft exit strategy' at the start of a study, which is constantly re-visited and adjusted through fieldwork according to the requirements of participants and the study.

10.3 Farm family survival and neo-productivism.

The aim of this study was to provide an explanation of the survival of the family farm throughout periods of agricultural change from the end of the Second World War to the current day. However, Chapter 2 stated that emerging literature suggests that it is likely that the UK agricultural sector is about to face even further change in the form of a neo-productivist phase

(Ambler-Edwards *et al.* 2009; Bridge & Johnson, 2009; The Royal Society, 2009). Neo-productivism aims to renew emphasis on the need to produce food, while maintaining an awareness of the need to protect and conserve the environment. These principles will be implemented through the use of various forms of technology. This added a sense of urgency and relevance to the study because outlining the reasons behind the persistence of the family farm to the current day could enable a prediction of whether they will continue to do so under neo-productivism, or face extinction.

The study argued that the survival of the family farm was related to the use of three tools: their internal dynamics, engagements with technology and external connections. It presented detailed examples of how these tools were used to complete tasks and agricultural practices according to particular motivations such as maintaining a good way of life or producing food. These practices and motivations were centred on the ultimate goal of passing on the family farm to the next generation thereby 'keeping the name on the land'.

This provided compelling evidence of the capabilities that have enabled the family farm to survive since the end of the Second World War. This research may be used to consider the possibility of continued persistence under neo-productivism. For the farm family at Fferm Ysgawen, survival was not a fanciful dream or throw away line, but a very real concept that was manifested in the everyday practices, motivations and goals of the family farm. This indicates that the family farm will face the possibility of agricultural change with a sense of confidence born out of significant practical expertise and past experience, to undertake new or modified processes in order to survive. This display of strong and steady self-assurance, alongside the flexibility to

introduce or change practices will be particularly persuasive for the prospects of the family farm.

The compelling nature of these arguments suggest that the family farm is sufficiently equipped to persist resiliently and confidently through forms of future agricultural change. It is now pertinent to consider what they may be able to teach us about the principles and implementation of this new phase of agriculture.

10.3.1 The farm family on the principles of neo-productivism

The farm family at Fferm Ysgawen did have some opinions on the principles of neo-productivism. They considered food production and environmental conservation to be contradictory objectives which were impossible to balance. Llew stated “you can't have your cake and eat it”, which is a phrase similar to 'you can't have it both ways'. This is a blunt statement which indicates clearly that it will be difficult for the proponents of neo-productivism to embed its key principles in the psyches and mentalities of the farming community.

Considering the importance of productivist motivations (see Chapter 7), it is likely that out of the two key principles, it will be most challenging to implement neo-productivism without causing environmental damage to the countryside. Introducing these principles will therefore require significant support, which might incorporate effective communication through established and trusted channels such as Farming Connect (see Chapter 9) and financial incentives. For example, the subsidies offered to encourage farmers to participate in agri-environmental schemes could be used to persuade them to re-incorporate a restrained amount of production. Another option might be to

abolish or modify the Basic Payment Scheme (formerly the Single Farm payment) in order to re-couple subsidies with food production and conservation.

In addition to the opinions of the family farm, the study was also concerned with their practices and actions. This aspect of the research suggests that imagining and implementing a balance between production and conservation may not be so challenging after all. The family farm members considered producing food to be one of their primary objectives. This is reminiscent of the long-held motivations of many family farmers, as this culturally ingrained function of farming was affirmed deeply during the era of post-war productivism. This provides further evidence that other forms of farming such as 'post-productivism' or multifunctionality have not provided adequate opportunities for family farmers to stop production. This means that it is extremely likely that the neo-productivist goal of increasing food production would be a familiar and popular notion to family farmers. However, while the motivation to produce food is deeply persuasive to family farmers, it is not without conditions or reservations. For example, Chapter 7 discussed that sheep were not selectively bred and reared purely for profit, but to fulfil the desire to have a 'good looking flock' which inspired pride and satisfaction (cf. Grasseni, 2004). The same chapter also described the sadness that resulted from sending beef cattle to the abattoir even though their slaughter constituted a farm product and significant source of profit. In this respect, there is a sense that food production is combined with a concern with conserving particular breeds of animal, the agricultural landscape and the family farming way of life.

Fferm Ysgawen was not involved in any agri-environmental schemes. These schemes have proved to be financially beneficial to some family farms, but Fferm Ysgawen did not wish to participate. This decision was justified by an explanation of the amount of 'red tape' and bureaucracy that the family members perceived to surround the set-up, implementation and inspection of these schemes. Seemingly in contradiction to this, the family members were enthusiastic about areas or elements of the farm that were non-productive. For example, Chapter 7 described that particularly in the summer months, they enjoyed spending time at the lake having a drink and a barbeque, fishing and kayaking. The chapter also discussed how the family members were keen to see wildlife on the farm, particularly red kites, which were considered an important symbol of the Welsh countryside. This provides further evidence that farmers do carry out conservation activities, but are not necessarily willing to be involved with conservation schemes (Falcolner, 2000). The family were also committed to being 'self-sustainable' by growing as much animal feed (such as grass, which was converted into silage for the winter) on the farm. This was primarily to avoid being dependent on another agri-food business for a valuable farm community, but it also resulted in the conservation of resources such as finance and fuel (as there were reduced trips to the store to collect feed). These examples suggest that while Fferm Ysgawen was not involved in any formal agri-environmental scheme, their food production was genuinely tempered with the protection of certain elements of the environment and farm resources. Elements were selected for predominantly socio-cultural reasons such as the promotion of family farm independence of synonymy with 'Welshness'. This indicates that regional and cultural identity

plays a more vital role in day to day farming than has been acknowledged previously.

Consequently, despite the opinions of the farm family members, their actions suggest that the balance envisaged under neo-productivism may not be as far removed from their current principles as first thought. In terms of embracing neo-productivism, this indicates clearly the merit in not only asking farmers about their preferred principles but in undertaking an in-depth investigation into the practices that constitute them. This reveals the unexpected nuances between food production and conservation, which may suggest a brighter prospect for neo-productivism than first thought. This process will also support any required change to these practices because an awareness and active engagement of the current situation will inspire respect and cooperation amongst the farming community. Rather than changing the whole agricultural approach employed on family farms, it is evident from the identification of current practices that alignment to neo-productivism already exists and may therefore be encouraged and built upon. This will act as a useful 'starting point' from which the modification or the introduction of new activities that may be necessary can be promoted.

10.3.2 The family farm on the implementation of neo-productivism.

This thesis has provided detailed and comprehensive examples of the ways in which the farm family of Fferm Ysgawen used technology. This provided a strong critique of arguments that emerged during the post-war era that family farmers would not have sufficient external connections and funding to enable them to adopt technology, which would eventually lead to their demise.

Unfortunately, despite the significance of family farming within the UK agricultural sector and this firm assurance that they have adopted technology, literature on agricultural change does tend still to dismiss their future role in the UK agricultural landscape. This study recognises this role and thereby offers the first specific indication of how successful family farmers might be under neo-productivism as a result of engagements with technology.

Genetic modification has been described as a very important form of technology for neo-productivism. Chapter 8 revealed that an interaction with this technology occurred sub-consciously as its presence was subsumed within farm products and processes. The role of genetic modification in creating the ingredients within the animal feed only became known to the farm family as a result of a focused discussion. This highlighted that genetic modification is not wholly new or revolutionary, but is already very much in existence within the agricultural sector. This is interesting because literature associated with neo-productivism states that while genetic modification is likely to be an extremely important technology for this agricultural phase, its increased use will be subject to an alleviation of vociferous debate and intense concern from the general public. However, this example from Fferm Ysgawen suggests that the family farmers who will be largely responsible for the realisation of neo-productivism will not find the adoption of the challenge unfamiliar or challenging. Consequently, it may be that the application of genetic modification under neo-productivism may not be as problematic as first thought, certainly from a producer's point of view.

Literature on neo-productivism states that while genetic modification will be important, other forms of technology will also play a role. It is unclear exactly

which individual technologies will be most successful in fulfilling the aims of this agricultural change. Chapter 7 described how Fferm Ysgawen used a number of objects which were perceived as technology, pieces of equipment or kit and machinery. These ranged from tractors and their attachments, quad bikes, calf and lamb feeders, and silage pit mats. This indicates that, contrary to perspectives that emerged during the era of post-war productivism, family farmers are well-equipped to introduce a variety of technology. This indicates that family farmers will play a significant role in the implementation of neo-productivism. It also suggests that in addition to controversial technologies which have been featured in headlines and news stories, those which might be considered more 'ordinary' or 'mundane' will be important.

Family farmers did not introduce technology in a non-autonomous way.

Chapter 9 provided a detailed example of the decision-making processes that the family farm members of Fferm Ysgawen undertook prior to purchasing silage pit mats. This involved listening and observing their use on a neighbouring family farm before considering how they would 'fit in' with the activities, motivations and long-standing goals of their own. This example indicates that family farmers would not only introduce technology, but would be able to evaluate, discuss and trial those which would be most successful and those which would not. As a result, the farm family would selectively introduce the best technology, which upheld their motivations (e.g. to spend conservatively on multi-functional products), which would not only allow them to survive under neo-productivism, but to thrive.

Chapters 8 and 9 showed that family farmers prefer technologies that are relatively simple in construction because it enables them to carry out repairs

or modify them to perform different functions to those intended by the manufacturer. Technologies must therefore be useful and flexible within their own specific farm set-ups. These preferences relate to underlying motivations such as being able to use technology independently without referring to the manufacturer for 'customer support' and saving money which would be spent on multiple 'single-function' items or for repairs for more important needs. This allows some interesting reflections on the technologies cited as important for neo-productivism. For example, much has been written about the ownership of genetic modified organisms in the form of crop seeds not by the family farmers who cultivate them, but by organisations such as Monsanto (Pechlaner & Otero, 2008). The concern with independence expressed by the members of Fferm Ysgawen suggest that unless ownership fell exclusively to them, it is extremely unlikely that they or other family farmers would adopt this form of technology at all. As a technology that has been described as very significant to raising food production under neo-productivism, this could represent a major constraint on the realisation of this agricultural goal. While discussions about other forms of technology useful to neo-productivism are ongoing, this makes it clear that they need to be geared specifically to the interests, preferences and motivations of family farmers.

This chapter has emphasised and reflected on the key contributions of this thesis. These are centred on the production of a detailed account of the everyday knowledge-practices, engagements with technology and interactions with off-farm entities present on a family farm. This revealed a set of motivations and an embedded overall aim. Together, these have contributed

new and deeper insights towards an explanation of how family farms have survived since the end of the Second World War to the present day. This conclusion has begun to expand these contributions even further by also looking to the family farm's future agricultural change. It has identified themes that resonated through the results chapters and considered how they might be used to form a new conceptualisation of the family farm. Following research that has identified an abandonment of the boundary between the 'human' and 'natural' world, it explored how the honey bee hive provides an interesting way of framing theoretical thoughts on the family farm. For example, while there were some helpful similarities, a reading of the swarming process undertaken by honey bees emphasised even more strongly that the relationship between family farmers and their farmland is comparatively unique. The chapter also undertook some critical reflection of the method of ethnography, with particular focus on its potential to further the explanatory power of future research within the sub-discipline of agricultural geography. Finally, it returned to the overall aim of this study, namely to explore the conundrum of the survival of the family farm. Having succeeded in providing robust arguments which explain its persistence over time and current significance, it also reveals that family farms are perhaps better placed to succeed in the future, such as under emerging neo-productivist conditions, than might be credited by many contemporary commentators.

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