

Title	Using digital storytelling with Irish farmers as an arts-based methodology to understand sustainability
Authors	Bowen, Maeve
Publication date	2021-12
Original Citation	Bowen, M. 2021. Using digital storytelling with Irish farmers as an arts-based methodology to understand sustainability. PhD Thesis, University College Cork.
Type of publication	Doctoral thesis
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Download date	2026-10-09 23:55:44
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**Using Digital Storytelling with Irish Farmers as an Arts-Based
Methodology to Understand Sustainability**

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**Submitted for the degree of PhD Social Science
Submitted to National University of Ireland, Cork
The Department of Social Science**

**Final Submission December 2021
Supervised by Professor Seamus O' Tuama and Dr. Ger Mullally**

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DECLARATION

This thesis is my own work and has not been submitted for another degree, either at University College Cork or elsewhere.

Signed:

Maeve Bowen

Maeve Bowen

Acknowledgements

A big thank you to Liam for his constant support and belief in me whilst I was doing this work. Thanks to my sister Helen, who put me on the road to UCC when I was 17 (many years ago now!) and to my sister Trish for her constant interest and support and being one of the few people who actually knew what I was doing! To Mum and Dad, who both passed away whilst I was doing this project, I got there in the end! To Sheila, Mary and Alan, thanks for keeping me going!

Thanks to Carbery Group Ltd for facilitating this research, particularly to Enda Buckley, Paddy Barrett and Sinead Treanor for their input. Thank you to the co-operatives in West Cork of Drinagh, Lisavaird, Bandon and Barryroe who took an interest in the research and who facilitated it.

Thank you to Teagasc who joined the research working group, particularly Dr. Laurence Shaloo and Dr. John McNamara, whose advice and insights were very valuable. Thank you to my then Employer, Macroom E, who supported this work.

Thank you to the Environmental Protection Agency for providing some grant-aid for this research and particularly to Keiron Philips for his interest and support throughout this work.

Thanks to Professor Seamus O' Tuama and to Dr. Ger Mullally of University College Cork, for their supervision.

Most of all, sincere thanks to the farmers in West Cork who took themselves out of their comfort zones to make the digital stories for this research work, I very much appreciate the interest, creativity and participation expressed by all. I hope that they will continue to tell and record great stories for years to come.

Thanks also goes to the 193 farmers who took part in this research, I appreciate the time it took to do this.

I hope that in some small way, this work can help us to understand people's relationship with sustainability and to reflect on some novel methods we can use

both to understand sustainability and to help people to connect with the subject so that we may change and adapt to keep our planet healthy in the future. In particular, I hope this study is informative to those with an interest in arts-based research and that the study highlights the positive ways that digital storytelling can be used in this way.

Maeve Bowen



Photo of Story-tellers and their families taken at workshop in Rosscarbery, County Cork, Published by the Southern Star Newspaper

ABSTRACT

The thesis investigates the ways in which sustainability is understood by farmers in a part of Southern Ireland. The central innovative methodology adopted for this study is the use of digital storytelling as an arts-based methodology for data collection.

The concept of caring and connectedness, particularly to nature, to family and to a continuity between generations are the key themes of the stories, along with farmers viewing themselves as stewards of the countryside and being custodians of the land. The focus on the economic aspects of sustainability (cost factors, both from an expense and a savings perspectives), although included in the stories, does not come across as one of the key themes.

The second strand of the research proceeded to undertake a profile of a wider group of farmers in order to infer the results of the story-makers to a wider group. The profile shows a high degree of similarity between the story-makers and the wider group of farmers.

A third strand of the study asked farmers what needs to happen for farmers to adopt environmentally friendly practices. The findings show that farmers need a better understanding of good environmental practices and its benefits, more advanced practices need to be costed and the rewards for implementing them explained fully so farmers can adopt them quicker. But farmers do not believe that changes should come at a cost to them as they believe that with the current price of milk and the hours that they work, that they are already not adequately rewarded.

The fourth and final part of the study, showed the digital stories to a wider group of farmers and the findings of the research show that farmers are positively disposed towards the digital stories as a method of communication. Importantly, the majority found the stories to have a positive influence on their attitude to making environmental change. The main reasons for their willingness to implement pro-environmental practices related to the cost benefits of implementing change and identifying with the storyteller (being able to relate to the storyteller and to his farming circumstances).

The thesis finds that conducting research using arts-based methodologies, can produce extremely valuable insights into how people experience the world and what they place importance upon and that the first person narrative, which is often emotional, can have an impact on viewers, in terms of their engagement to the themes of the stories and their readiness to adopt changing practices. This research bears true of the literature review in which peer to peer communication, bottom-up, visual and emotional material can connect strongly with the audience. It also highlights how communication technologies can be used as facilitating tools for participation and engagement. It is hoped that this research reveals farmers' deeper understandings of sustainability and that it further adds to the lack of research on the construction of environmental communication in new media and the importance of how environmental communication is framed.

CHAPTER 1: INTRODUCTION

The contribution of agricultural production to climate change in Ireland is considerable and it is important, therefore, that pro-environmental changes take place in farm practices throughout the country. In the debate around the environment and climate change, the word “sustainability” is frequently used to describe a type of lifestyle and economy where nature and humans exist on the planet in a ‘sustainable’ fashion. Yet from the literature, we will see that sustainability is not easily explained, nor understood and yet it appears as a ‘Nirvana’ which our planet, if it is to survive needs to grasp. In fact, we will see from the literature review and this primary research, that sustainability does in fact mean different things to different people and is not a ‘one size fits all’.

Also as sustainability is a complex subject, it can present a difficult methodological problem in that in an interview or a questionnaire setting, it may prove difficult to understand what it means to farmers who have busy lives and tight margins. Because of this, I wished to search for a methodology which would allow farmers to reflect on the question, in their own time and to provide a response to this question, with less prompting by the researcher. One of the innovative methodologies I adopted to do this, was the use of digital storytelling as an arts-based methodology to investigate the meaning of sustainability to farmers (by farmers making their own digital stories).

Storytelling is an emerging process, not an extracting process. The researcher is not extracting information from people but allowing it to emerge naturally from what they consider to be important. It’s a very different way to initiate the collection of data, and I wished to use this to get a rich picture of what the subject of sustainability meant to the farming community.

Digital storytelling itself refers to making a short video in a first person narrative, in this case ranging in length from 3-6 minutes long. The video is made by the farmers themselves having engaged with two workshop sessions provided to the group as part of this study. Siebert, Toogood and Knierim(Siebert, Toogood, & Knierim, 2006) argue that the conceptual analytical framework for a social scientific analysis of the motives and influencing factors behind farmers’ actions needs to be broad enough to

integrate sociological, psychological and economic concepts to capture the relationship between ideas, knowledge and action. By asking farmers to create a narrative around the meaning of sustainability through a digital story, the intention was that this method would allow them scope to do this.

Along with this, I used social and psychological constructs to compare the farmers who made the stories with a wider group of neighbouring farmers. The intention was to see if the farmers had a similar profile thereby, lending weight to the story analysis by inferring the results to a wider group. The selection of these constructs are discussed in greater detail in the following two chapters.

Following on from this, I asked farmers 'what would need to happen for farmers to adopt environmentally friendly practices on their farms' and this study discusses the detailed responses to this question.

Communicating and engaging with farmers in sustainability is extremely important and this thesis investigates approaches which are based on how to approach people on an effective emotional level, through exploring bottom-up, non-expert climate perceptions and understandings rather than top-down expert understandings. To explore this area, the last part of the methodology involved sending a wider group of farmers one video per week with a number of questions to answer, once they had viewed the video. At the end of the ten weeks (and the ten videos), farmers were asked to complete a final questionnaire on the videos they had viewed (which were made by the ten farmers in the first part of the study) and the influence that they felt it had on them.

To complete this study, I worked closely with a food company based in West Cork, called Carbery Group Ltd. In several cases, the co-operation between farmers and food industries to meet retailer and consumer needs has produced private (voluntary) sustainability schemes endeavoring to achieve a more sustainable supply chain and to create value for the stakeholders. One such programme, is the Carbery Greener Dairy Farms Programme, run by Carbery Group Ltd. Based in West Cork in the South of Ireland, it has been in operation since 2010 in conjunction with Teagasc, the National Farmer Advisory Service. At the time of the research, 17 farmers had taken part in this programme and these farmers were willing to engage with me in relation to making digital stories.

1.0 Personal Motivation / Background

I returned to University to undertake the research for this thesis approximately twenty years after completing my master's degree. At this point, I had worked in various types of employment from small businesses, multi-national corporations and non-governmental organisations. When I was in my thirties, I took on the role of General Manager of a new environmental industrial park and enterprise centre in Macroom, County Cork, called Macroom E. The organisation had two objectives: 1) to support start-up and growing businesses and 2) to promote environmental good practices to SME's. At this time (2004), discussion on the environment was not as prevalent as it is now and it was difficult to engage businesses in the conversation and to change practices in their business operations. In efforts to do this, I undertook various types of programmes to engage, inform and advise businesses. These included training workshops, seminars and setting up networks of businesses to re-use materials (linking into the circular economy concepts).

One such programme, undertaken with the Cork Institute of Technology and the Municipality of Vienna, Austria was called Eco Business Ireland Awards. We learned from a successful programme that was in operation in Vienna and developed our own programme in Macroom with local businesses. These businesses were assisted to examine and improve their practices in relation to energy consumption, waste and water. Our approach was to encourage businesses via an economic advantage model i.e., if businesses changed certain practices they would save money (whilst also benefiting the environment).

However, we found that although there were many cost savings to be achieved, that businesses oftentimes still did not change their practices and it was not apparent why this was. I began to consider that perhaps there were deeper elements to this problem apart from informing businesses of the cost saving they would achieve and then helping them to implement this. If businesses were not convinced to change practices (although they would save money) then what would encourage them to engage in the subject and once engaged, what would encourage them to change? This attracted me to the area of narratives which is the foundation of this thesis. As agriculture plays such a large role in terms of carbon emissions and considering that my master's degree researched farmers (in relation to the willingness to adopt farm forestry as a farm crop) I decided to focus on the farming community for this work.

In terms of technical skills, I initially joined a master's programme in UCC on interactive media which equipped me with the skills to animate and produce video. After this, I joined the PhD programme and commenced the research into this area.

1.2 Study Questions

This study focuses on the following questions: -

- 1. What messages do farmers convey when asked to produce a digital story about sustainability on their farms?**

The relevant literature is extensive in relation to farmers adopting pro-environmental behaviours and practices. In terms of change, it is important to understand what the meaning of sustainability is to farmers and this is one of the main research questions of this study. This study provides a narrative analysis of the digital stories made by farmers and investigates the key themes which emerge through their stories.

- 2. How do the 10 story-makers compare to a wider group of farmers?**

As the sample size in this study is limited to just ten stories, I wished to know if the results of the narrative analysis could be inferred to a wider population of farmers. For this thesis, I developed a questionnaire which was suitable to the needs of my study based on social and psychological constructs. I then analysed the similarities and differences between the sample of 10 farmers and the wider group of 193 neighbouring farmers.

- 3. What are the views of farmers in terms of what needs to happen for farmers to adopt environmentally good practice?**

Farmers were asked this question and 153 farmers responded to it and the findings chapter provides an analysis of these responses.

- 4. Does viewing the digital stories by a wider group of farmers influence their intention to adopt pro-environmental practices?**

Once the digital stories were completed, the stories were circulated to a group of farmers to get their feedback on what they thought of the video's and to investigate their responses. The videos were circulated over 10 weeks (1 per week) and farmers were asked a number of questions after each video. Overall, the survey aimed to assess what effect the digital stories had on the likelihood of farmers adopting pro-environmental practices.

1.3 Thesis Overview

Chapter two will set a context for this study and will set the scene in terms of Irish agriculture and the sustainability debate. **Chapter three** will provide a literature review including a discussion on communication approaches and the social and psychological constructs chosen for this study. **Chapter four** provides a detailed explanation of the methodology for this study. The central innovative method adopted for this study is the use of digital storytelling as a method of data collection. The chapter provides a detailed overview of this methodology and provides the reader with an explanation of the other research methods such as the questionnaire used for this study. **Chapter five** summarises the analysis of the stories made by farmers and the messages communicated by them. The detailed analysis of the stories is broken down by codes and themes. **Chapter six** compares the profile of the 10 farmers who have made the stories with a wider group of 193 farmers (neighbouring farmers and suppliers to Carbery Foods) to examine if the profile of the farmers is similar across a range of psychological-social constructs. This is undertaken to see if we can draw wider implications from the study of the 10 farmers to a wider cohort of farmers. **Chapter seven** examines the views of farmers in terms of what needs to happen for farmers to adopt environmentally good practices and provides a detailed narrative analysis of same. **Chapter eight** examines the feedback from the farmers who viewed the stories and if the digital stories would influence their engagement in a change in farm practices. **Chapter nine** provides a conclusion to this work, my own insights and recommendations for future research.

CHAPTER 2: BACKGROUND CONTEXT TO THIS STUDY

2.0 Introduction

One of the objectives of this thesis is to investigate the meaning of sustainability to a sample group of farmers, through the medium of their digital stories. This chapter examines the meaning(s) of sustainability in the academic literature so as to provide a context and background to the primary research. When discussing the environment, a number of terms are used along with sustainability and these include: sustainable development; the SDGs (Sustainable Development Goals); the Anthropocene and climate change and so this section includes a discussion of these terms also so that sustainability can be put into a broader context.

This chapter will start by examining why the environment is so important for the future of the planet and then provide a background on agriculture in Ireland. The later sections will then concentrate on sustainability and related terms.

Environmental crisis, such as species extinction, global warming, air and water pollution, and wild land destruction, are some of the most important problems currently facing our society (Kortenkamp & Moore, 2000, p. 1).

These environmental crises have been described by Jeffrey Sachs (Sachs, 2012, p. 2207) as

“climate change as a result of human-caused emissions of greenhouse gases; massive environmental pollution (e.g., the poisoning of estuaries and other ecosystems as a result of heavy runoff of nitrogen-based and phosphorus-based fertilisers); the acidification of oceans caused mainly by the increased concentration of atmospheric carbon dioxide, which is the most important human-produced greenhouse gas; the massive loss of biodiversity caused by unsustainable demands on forests and the continuing conversion of forests and remaining wilderness into farms and pastures; and the depletion of key fossil resources, including energy (oil, gas, coal) and groundwater.”

Beyond the environmental threats, the human race has to deal with other serious threats that are part of the sustainable development agenda. One of the main issues is that the human population continues to grow rapidly, by around 75-80 million per year and is on a trajectory to reach 9 billion by the middle of the 21st century and 10

billion by the end of the century. This is on a planet that is already struggling to cope with the existing population and the depletion of resources and increases in greenhouse gases.

In 2019, Ireland's provisional GHG emissions are estimated to be 59.90 million tonnes carbon dioxide equivalent (Mt CO₂eq), which is 4.5% lower (or 2.80 Mt CO₂ eq) than emissions in 2018 (62.70 Mt CO₂ eq). Emissions reductions have been recorded in 6 of the last 10 years of inventory data 2009-2019 (Source, the Environmental Protection Agency). Agriculture was the sector with the largest greenhouse gas emissions in Ireland over the 1990-2017 period with 33% of the total in 2017 (CSO).

Ireland has responded in various ways to these environmental challenges. As a member of the EU, the Irish State signed the Kyoto Protocol. It is also part of the separate 2015 Paris agreement, which set the goal of limiting global temperature rises to below 2 degrees Celsius whilst recognising and pursuing staying within an increase of 1.5 degrees Celsius. An EU-wide emissions trading scheme (ETS), which Ireland is also a part of, means certain industries have to trade in market-priced carbon allowances, each equating to a ton of CO₂ emissions.

Driessen et. Al. state that when looking at the environmental threats “not only do we need to understand the complicated science behind the climate system – including its interactions with the earth surface – but more importantly, perhaps, we need to understand the behavioral dimensions of the problem.” (Driessen, Leroy, & VanVierssen, 2010, p. 146).

The research is clear in that the planet faces serious environmental challenges and that there is a need for these problems to be addressed with a focus on trans-disciplinarily involving the earth sciences, engineering and the social sciences. With this in mind, this chapter focuses on agriculture in Ireland and meanings of sustainability. This chapter starts by setting the scene in terms of Irish agriculture including an investigation of the political economy of farming in Ireland and a discussion on such issues as neoliberalism and capitalism. Once the agricultural scene has been set, attention is then turned to meanings of sustainability.

2.1 Agriculture

The Agri-Food sector is one of Ireland's most important indigenous industries, playing a very important role in Ireland's economy. The sector employed over 164,400 people or 7.1% of total employment in 2019. Some 137,500 farms produced over €8 billion in output, over 770,000 hectares of forest, and over 2,000 fishing vessels and aquaculture sites produced fish with a value of €770 million. The Agri-Food sector is export-orientated, Ireland exports almost 90% of the food produced. Exports of Agri-Food products in 2019 were valued at €14.5 billion, a 63% increase from €8.9 billion in 2010. (The Department of Agriculture, Food and the Marine website 2020).

O' Shaughnessy and Sage (Shaughnessy & Sage, 2017) point out that during the past half century, Irish agriculture has gone from being a system dominated by traditional mixed farms, integrated with local and regional food markets, into one where specialist farmers with higher levels of output supply expanding urban populations.

With the introduction of an industry-led strategy in 2020 that was approved by Government, 'Food Harvest 2020' established a roadmap for growth with ambitious targets for output. "Food Harvest 2020" set out clear production targets for meat, seafood, cereals and other sectors. However, dairy has been the flagship with the strategy setting a goal of 7.5 billion liters of milk output in 2020, an increase of 50 percent over 2010. 'Food Harvest 2020' has been extended through a successor programme, 'Food Wise 2025' with a continuation of high aspirational targets.

O'Shaughnessy and Sage (2017) say that these targets seem partly justified by making a contribution to feeding the world which the authors believe reveals a great deal about the way such moral claims are used to conceal or downplay some of the social and environmental consequences. Furthermore, the authors highlight the shift in European Policy from productivist to multifunctional agriculture. This, they say, is based on a growing concern that the productivist agricultural model does not enhance the resilience of the agri-food systems and scores poorly by the criteria of environmental sustainability. They argue, that there is a growing divergence between intensively managed farms located in the best agricultural areas and the more economically marginal farms which are struggling to survive in peripheral but ecologically important areas. The authors believe that these divergent pathways are raising profound ecological and social concerns in both contexts. They go on to say

that there is an urgent need for Irish agricultural and agri-food policies to move quickly to develop a strategy that can plan a transition road map from productivism to sustainability that protects and enhances the stock of public goods (Shaughnessy & Sage, 2017, p. 188).

Irish farming has made extensive use of conditions favoring the abundant growth of grass. It has long been accepted that grazing animals at low to medium stocking densities can work well with maintaining a biologically diverse landscape. In Ireland, cattle remain on grass for the greater part of the year and feed on fresh pasture and silage (and concentrates over Winter). This 'natural' practice appears to make a strong environmental case for agriculture.

Yet, one of the pressing questions that has been in Irish agricultural policy over the last number of years is the degree to which a socially, economically and environmentally sustainable agriculture can be developed around intensive livestock production.

Tovey and Share (Tovey & Share, 2003) outline how Irish agriculture has changed through the decades and has moved away from a mixed type of farming to one that is defined by specialisation with 'specialists' in the more profitable type of farming (including dairying, cattle fattening and cereals) tending now to be large farms in the East and South East of the country. She argues that this focus on 'productionism' has concerned itself in an increasingly narrow way with the productive function of agriculture i.e., its capacity to produce food or raw materials for the food-processing industry, and has disregarded other important functions such as the care and the management of the environment.

Shaughnessy and Sage (2017) suggest, that in order to realise the potential associated with conservation farming in Ireland, a cultural shift will be necessary to fully move towards a viable, multipurpose and environmentally friendly agriculture. Yet, they point out that unfortunately, the incentives in place seem to be pointing in the opposite direction, encouraging farmers to scale up production in pursuit of high farmer incomes, often at the expense of public goods".

It is evident from the research that farming practices need to change and there is a great deal of scope for using social and behavioral sciences to support this. The international evidence is that behaviour change is not a one by one persuasion task

but a social challenge. Jeanne Moore (Moore, 2012) suggests strategies of forming networks of farmers, focusing on the local level, and adopting a holistic approach. Drawing on previous work, Moore points to the importance of action across all levels of society including institutional, inter-personal and personal bringing new forms of cross-fertilisation between the economy, society and public governance, enhancing the ability to learn and innovate and recognising the key role of changing behaviour and social practices.

Understanding that such practices are shaped by social, cultural and geographic contexts such as local ways of doing things, demographics and farming traditions is important for long-term change, Moore points out. The key message of Moore's research is that we need to move from a focus on the individual to shared practices and to really understand the deeper motivations and values of those involved. (Moore, 2012).

Although this thesis focuses on farmers' individual practices, a sustainable future will not be achieved in its entirety by relying solely on initiating 'bottom-up' changes in individual behaviour as macro-institutional approaches to sustainability are extremely important. There is a need to understand the economic and political context in which Irish agriculture sits and the power structures and lock-in factors that exist for Irish farmers. The next section will focus on this after which the chapter will turn to addressing the many meanings of sustainability.

2.2 Understanding Irish Farming in a Wider Context

Some of the most compelling characteristics of environmental problems are the social, cultural, political and economic structures within which they operate. Individuals are often faced with making daily decisions in a setting and context that they did not create, in terms of who has political power, who has control over resources and, in a broader sense, what infrastructural and technological options are available and why.

The state uses a range of policy measures to achieve its policy goals, which are based on its working assumptions regarding individual and collective behaviour. An EPA report, called *Beyond Neoliberalism* (2018) states that there is a need to move

beyond a simplistic approach that addresses discrete elements of human behaviour and seek to understand their embeddedness within the culture and institutions of wider society. The EPA report continues to highlight a need for an emphasis on a new model that recognises the responsibility of those empowered to govern in driving sustainability and that acknowledges their role in defining societal values.

Although, this is not the specific focus of this thesis, it is important to consider and understand the arena in which Irish Farming operates, in order to provide a broader context to how different subsystems (markets, institutions, etc.), and within them different groups with conflicting interests (policymakers, consumers, investors, etc.), have co-evolved.

The following sections will discuss agriculture from the perspective of relevant Irish, European (EU) and international landscapes along with the markets in which agricultural produce trades.

2.1.1 Productivism and Irish Agriculture

Irish agriculture operates in a productivist regime. Productivism consists of numerous actors who have differing degrees of agency to pursue their own goals. Typically, productivism impedes the development of alternative sustainable farming techniques and by doing so any actor who wishes to implement sustainable practices are usually unable to do so due to a series of 'lock-in factors' (Lamine C. , 2011). What are these lock-in factors? Agricultural lock-ins are created, for instance, through the European agricultural policies that subsidise farmers to protect them from market volatility. Farmers have become heavily reliant on these subsidies as a consistent source of income but they encourage farmers to increase production to ensure a constant supply of produce. Lock-ins have also been created as farmers' constantly try to keep up with production demands by increasing their use of fertilisers to compensate for declining soil fertility, intensifying pesticide use to combat increasingly resistant pests, and making investments in intensive machinery and infrastructure (Lamine C. , 2011). Farmers practices are heavily tied-in and restricted by the rules and norms that have been developing over long periods of time, generally driven by the need to ever-increase production. Addressing these lock-ins would require action from actors at multiple scales including local, national and international.

Sage and Kenny (Sage & Kenny, 2017, p. 41) trace the development of productivism in Irish Agriculture and interestingly conclude that the “consequences of productivism at home are significant principally through depleted environmental support systems and associated potential threats to human wellbeing”.

In an agricultural context, productivism consists of rules that are created by strict government regulations driving production, and global markets that demand standardisation of produce. These rules have developed over such long periods of time that they have fostered norms, where farmers have become locked-in to such an extent that they generally take the rules for granted (Lamine C. , 2011). Farmers are often unaware of the possibilities to adopt alternative farming methods because typically the farming practices are reinforced by these dominant rules and norms. An example is the use of pesticides – a farmer is unlikely to choose to reduce their use of pesticides because often they lack the knowledge and support to experiment with pest-resistance crop varieties or to diversify their produce, and therefore reducing pesticides would bring the risk of losing a significant portion of their yield to pest damage. They lack the knowledge because, while educational programmes can stimulate a better understanding for farmers of how they can make these changes, productivist knowledge programmes will be centred around efficiency and so the farmer is unlikely to be confronted with an alternative practice.

The rules of a productivist regime feature regulations as the most common governance tool, centred mainly around driving production, and reducing rather than eliminating negative environmental impacts. They write that regulations typically take precedent over more flexible public policies in the productivist regime, and therefore they are very top-down, standardised for large areas, and with short-term obligations.

Regulations are mainly centred around the Common Agricultural Policy (CAP), the main driving principles of which are meeting market demands for agricultural produce, export ability, and income support for farmers. Monitoring is typically carried out by regulators who usually take samples and conduct audits on farms, and they have the authority to sanction farmers for non-compliance according to regulations. Sanctions generally involve fines, or in more serious cases prosecution,

for non-compliance with regulations. Farmers have received incentives from the Common Agricultural Policy (CAP)'s Basic Farm Payment – which is a form of income support on the condition that they maintain basic levels of production and environmental standards such as maintenance of habitats. The Nitrates Directive allowed for efficiency of fertiliser input, whilst monitoring was solely focussed on meeting the requirements of this Directive, therefore these are conducive to the productivist regime since this was also tied to a basic level of on-farm production.

Other relevant stakeholders in this landscape include farming associations, who lobby and campaign for better incomes and working conditions, the largest of these being the Irish Farmers Association (IFA). The IFA's mainly rural coverage gives them a great deal of influence over the political agenda because the majority of politicians are representing rural, farming constituencies, and must respond to their needs (most of whom have IFA representation).

The beliefs of actors within productivism tend to be aligned with the principles that increasing production for the global market is necessary and that increasing input efficiency is sufficient to avoid degradation. The *macro-politics* are political developments happening outside of Ireland, which are the overarching European policies and regulations such as Common Agricultural Policy, EU Directives, and GHG reduction targets.

The roles the actors play within this system are important because these signify the flow of power from Government or industry down towards farmers, with a low degree of flexibility for farmers to practice farming more sustainably. This power imbalance is an important consideration when thinking about the position in which farmers find themselves.

Governments typically view growth as a priority as it is perceived as preventing or mitigating economic crises. This is true even in the face of imminent environmental crises. O Shaughnessy and Sage (Shaughnessy & Sage, 2017) point out that the consequences of the productivist agriculture model are becoming more widely recognised and that the 'race to the bottom' on prices has major repercussions for those farms located in more marginal environments. They emphasise that the model of 'foot to the floor' productivism does not work well for all parts of the agricultural sector and can deepen income inequalities which will result in further marginalisation

unless there are dedicated efforts to ameliorate these effects. In their opinion “productivism consequently scores poorly on inclusion and economic sustainability” Pg 1.

Furthermore, Morgan (Morgan, 2017) notes that, in the Irish context, the government has pursued an aggressive growth policy enshrined in the intensification of domestic agricultural policy, the prioritisation of multinational corporations with investment supports and a deference in relation to foreign direct investment, which is seen as a policy holy grail. Morgan (Morgan, 2017) describes Ireland as an example of a state that leans heavily towards neoliberalism in the context of its status as a small, late-developing and geographically peripheral actor in the EU. The next section will discuss this broader neo-liberal regime.

2.2.1 Neo-Liberalism

The productivist system of Irish agriculture fits within a neo-liberal economy. In Ireland, both fiscal and planning policy formation, implementation, and regulation were overtly shaped by the neoliberal policies adopted by the state, particularly in the period from 1997 onwards. During this time, the government pursued a neoliberal agenda of promoting the free market, minimising regulation, privatising public goods, and keeping direct taxes low and indirect taxes high. The state thus loosened regulation of the financial sector, introduced tax-incentive schemes, changed the parameters of stamp duty, lowered capital gains tax, allowed developers to forego their affordable and social housing obligations, promoted a laissez faire planning system, failed to address clientelism and encouraged local authorities to produce ambitious, localised growth plans (Kitchin, 2012). In short, it allowed the property sector to be driven by developers, speculators and banks, rewarding them with tax incentives, less tax obligations, and market-led regulation. Kitchin et. al (Kitchin, 2012) characterise Irish neoliberalism, “as a commonsense, partial, happenstance, and emergent piling up of market-oriented policies, strategies, and instruments, framed within its localist, clientelist political culture and system that operates across modes and scales of governance” (Kitchin, 2012). John Barry states that neo-liberal economics views the human being as “homo economicus” (rational, selfish, and possessive)” (Barry, 2015).

In this sense, neo-liberal economics is dedicated to the study of capitalism; in fact, other kinds of economies are not even contemplated. Yet the term “capitalism” does not appear in neoclassical economics text-books. Instead, economists refer simply to “the economy”—as if there is only one kind of economy, and hence no need to name or define it. But there are different ways to organise economies with capitalism being just one.

Barry (Barry, 2015) continues to say that despite this accumulating evidence, the neo-liberal economic paradigm and its commitment to unsustainable economic growth still reigns dominant both in terms of how we understand the economy and “economics” in public policy. This form of economics supports a particular view of the economy and society, one which, with a few exceptions, is supportive of a capitalist organisation of the economy, private ownership of the means of production, and production for profit. Furthermore, it justifies an unequal distribution of income and wealth; promotes free trade, deregulation, and economic globalization; and above all is committed to promoting orthodox economic growth. By orthodox “economic growth” is meant “undifferentiated, monetary/GDP measurements of economic growth as a permanent feature of the economy”.

This translates not simply into political power in determining state policies for example, but is equally a form of informing how we “commonsensically” think about, assess, and evaluate the economy and economic issues (Barry, 2015). Once a particular way of conceptualising and thinking about the economy is widely shared and commonsensical, alternative modes of thinking about the economy are by default deemed “nonsensical,” and indeed this has and continues to be the most common reaction to non-neoliberal economic perspectives—green or other (Barry, 2015).

The current neoliberal economic philosophy that has prevailed for over 40 years in Ireland (and other Western states) has openly encouraged privatisation, deregulation and the removal of barriers to trade and investment. This has been advanced as being in the interests of economic growth and holding to the much popularised view that the market will self-regulate and thus improve the welfare of all through a trickle-down process. However, the outcome of this has been to give increased powers to

institutions and corporations, which can move about in time and space in order to maximise their profits and avoid or control sustainability initiatives (Kasser, 2009) P30. Another prominent critique of neoliberal economic growth for Irish and Western societies is the very real threat that this growth model represents to the community and social fabric, which is the basis of human health and well-being (Kasser, 2009). People need to feel secure, competent, efficient and able to choose in relative independence from coercion and internal or external pressures (Clayton & Myers, 2015). However, where economic growth is a key goal of a nation, with its encouragement of self-enhancing and materialistic values, the fundamental needs required for human well-being are contradicted, as materialistic people are most likely to be dissatisfied with life.

2.2.2 A Background to the Growth and Influences in the Irish Dairy Industry

In order to understand what the aforementioned section has discussed in relation to Irish farming, the following sections will look at how the agri-food industry developed and in so doing, highlight the role of various different actors and associated power within the system.



Drinagh Co-op in west Cork was founded in 1923 by an enterprising and dedicated group of local farmers, together with the local curate, Fr John Crowley. The Irish Times, Patrick Doyle Tue, Jan 29, 2019

The co-operative movement's emergence at the end of the 19th century radically transformed rural society. The innovative and controversial idea behind the movement was that the farmers should directly own their business and means of production. The co-operative structure placed ownership of these businesses directly in the hands of farmers who joined as members with each individual given an equal say in the direction of that business regardless of wealth and status.

By the turn of the century there were 191 co-operative creameries in Ireland. With the prominent exception of the Belfast Co-operative Society, which serviced the retailing needs of urban workers in Belfast, co-operation in Ireland was largely confined to the agricultural sphere. Creamery societies dominated in terms of members, turnover and value added. As time went by, many of these evolved into multi-purpose agricultural societies, processing milk into butter, selling agricultural inputs, and making short-term credit available to farmers.

The years from the 1940s to the eve of Ireland's entry into the European Economic Community (now the European Union) on 1 January 1973 were years of consolidation and slow expansion. The larger societies such as the federation of creameries in Limerick known as Golden Vale or the more closely integrated Mitchelstown Creameries in north Cork diversified into a new range of products, cheeses, milk powder and dairy engineering. The prospect of entry into the EEC (European Union) in the early 1960s gave rise to a more urgent debate about rationalisation within the dairy processing industry. Though entry was delayed for a decade, the IAOS (now ICOS) took the lead in promoting ideas of merging existing societies into larger, more competitive groupings. These efforts enjoyed greater success in the 1970s, as farmers' resistance to the closure of small, uneconomical plants declined. The passing of the roadside creamery, with its local committee, was regretted by many but this was but part of a wider process of economic and social change affecting rural Ireland.

By the 1980s, the larger dairy co-operatives had evolved into diversified agri-business complexes, with a declining dependence on the traditional raw material of milk. Some societies had stretched the concept of the co-operative to establish subsidiary companies based on the legal principles of the private enterprise or joint-stock company. In just a few generations, some farmers had progressed from home butter making and roadside creameries to being the collective owners of a multinational business corporation.

1973-1984: Joining the European Union

Ireland joined the EU in 1973 when there were high rates of unemployment and emigration, low foreign investment, and a high dependence on the United Kingdom as its biggest export market for agricultural produce. Butter was the main form of export but it received a low price due to competition with other countries. Joining the EU could be labelled the beginning of the Irish productivist dairy regime in Ireland as it brought with it the first opportunity to export beyond the British market, and ultimately drove increasing production which, at the time, the struggling economy, and society, badly needed.

1984-2006: Milk quota

At the time, the Common Agricultural Policy was designed to protect farmers against a volatile agricultural market by providing a fair price for commodities such as milk. In this sense, the CAP was consistent with the beliefs of society at the time that economic growth was desperately needed, and therefore was immediately adopted as part of the Irish dairy industry. Providing subsidies to create a consistent supply of production fostered a lock-in for farmers and a new system of rules, norms and beliefs were aligned on the path of increasing production.

When Irish produce opened up to the wider markets, milk prices rose by 75% between 1975 and 1984. A gap between production and consumption emerged and a large milk surplus appeared within the EU known as the butter mountains. The EU acted on this surplus by implementing a new milk quota system in 1984 which allocated specific production volumes to its Member States, and this substantially restricted Irish dairy farming as growth was confined to a specified limit. Ireland was legally bound to enforce these milk quota's as a Member State of the EU.

2003: CAP Reform

There was little change until 2003 when a reform of the CAP aimed to break the link between subsidies and production, partly with the goal of strengthening environmental protection, but also in an effort to curb ever-increasing production. As a result of this, the reform introduced the Basic Farm Payment.

2003-2006: The Nitrates Directive derogation

The Nitrates Directive was introduced by the EU in 1991 and this required Member States to implement specific limits on fertiliser use on farms. In 2003, the EPA stated that there was considerable nutrient leaching from agriculture into Irish watercourses and this led to the Government's acknowledgement that they had to take action, and they implemented the Nitrates Directive in 2003.

2008: Financial crisis

While the dairy industry was constrained by the milk quotas, globalisation of business and technology networks grew which transformed the Irish economy away from agriculture and towards a more knowledge-based economy, until the 2008 financial crash occurred. The crash had a significant impact on farming causing dairy exports to decrease by 13% between 2008 and 2009. As a result, the Government began to invest more in marketing Irish agri-food produce for export through the state food board Bord Bia, and the agri-food industry was propelled into the centre of economic recovery for Ireland (DAFF, 2007). This shift saw a collaboration of government to speed up efficiency gains in the agri-food industry as a whole, aiming to boost the economy and increase competitiveness in 'feeding the world' (Shaughnessy & Sage, 2017).

2008: The ending of milk quota's

As the financial crisis continued, demands began to increase globally for agricultural produce and markets were opened up to the EU, thereby in 2008 it was announced that the milk quotas would end in 2015. The introduction of quota expiration meant a complete alignment of the productivist system. However, one year later a new pressure was implemented by the European landscape, as GHG emission reduction targets were announced (Buckley & Donnellan, 2019).

2009: Emission reduction targets

In 2009, Ireland committed to GHG emission reduction targets under the EU Effort Sharing Decision (Decision No 406/2009/EU). This set a target to reduce emissions by 20% by 2020 compared with 2005 levels (O'Brien, 2013).

As soon as the end to milk quotas was announced by the EU, the agri-food industry began to plan how to take advantage of the first opportunity to expand in 25 years and so began Food Harvest 2020 (FH2020). This policy introduced a radical new norm within the industry which stated that sustainable food production could be

achieved in a way in which environmental protection and economic competitiveness would be complementary (DAFF, 2015).

This policy was a roadmap for the volume-based expansion of the entire agri-food industry, but particularly the dairy sector where a target was set to increase milk production by 50% between 2015 and 2020 (Hurley & Murphy, 2017).

Interestingly, it is compulsory for any Government strategy to undertake a strategic environmental assessment (SEA) as a legal requirement in order to analyse the environmental consequences of a significant production increase. But because this was an industry-led policy no SEA was undertaken. Due to FH2020's significant potential to boost the Irish economy, the Government decided to formally adopt the policy in 2014 and selected an independent analyst who performed a SEA post-adoption (DAFM, 2014b). The SEA did not advise on any changes to FH2020, although it recommended environmental compliance "be placed at the heart of increased output" (p. 3). Here we can see the power plays within the industry.

2015: Food Wise 2025 (FW2025)

In 2015, FW2025 was developed as an update to FH2020 immediately after FH2020's adoption by Government (DAFM, 2015a). This focussed on ranking sustainability higher on the agenda than its predecessor. FW2025 continues with the same principle of FH2020 of maximising production efficiency whilst "minimising the effects on the environment and declines in biodiversity" and that "environmental protection and economic competitiveness are equal and complementary (p.4). Since the Irish dairy industry had already achieved the ambitious dairy production targets of FH2020, FW2025 created targets that took a more value-based approach to growth, aiming to increase the value of Ireland's food and drink exports by 85% by 2025 (DAFM, 2015a).

2017: National Mitigation Plan

The Government created their first strategy in dealing with climate change on a cross-sectoral basis in 2017, but it's useful to discuss the influence that the

agricultural industry has had in this process. In 2011, two years after Ireland committed to the 20% reduction of GHG's, the Government was being highly criticised by not only NGO's for their action against climate change, but also by opposition politicians.

In early 2012, the agricultural minister announced a Roadmap for Climate Policy and Legislation that put forward the steps for the development of national climate policy and legislation to cut GHG emissions and foster a low-carbon economy. While the roadmap was welcomed by the Irish Government, NGO Friends of the Earth criticised it for lacking urgency. Meanwhile, the IFA lobbied extensively against the Government's roadmap and were vocal that climate policy must not damage the country's economic recovery, and voiced fears that agriculture would become "the sacrificial lamb" for Ireland's "emissions difficulties (O'Brien & Sygna, 2013).

Part of the requirement of the 2015 legislation was that the Government produce a National Mitigation Plan (NMP) for addressing climate change – and this was completed in 2017. The NMP is a 5-year cross-sectoral strategy, where agriculture is guided by the principle of "sustainable intensification". According to Augustenborg (2019), this plan was weak in measurable impact and was the subject of criticism including by the Government's own Climate Change Advisory Council.

2019: Government-wide Climate Plan

In June 2019, the Government produced a new Climate Plan (Government of Ireland, 2019) that targeted every sector of Government, with measurable targets to achieve improved environmental performance, with both short- and long-term deadlines of up to 20 years. The plan includes targets to increase the use of more efficient forms of fertiliser from a current 1% in the Nitrogen market, to 50% by 2030, and to increase use of slurry spreading injections from 10%, to 50% by 2030. These actions can make improvements for water quality by reducing pollution, but they still are according to the productivist regime of input efficiency. The plan does suggest diversification from livestock, again implying reduced production but there are no concrete goals.

A lack of incentives for farmers to carry out sustainable farming is absent also from industry, who do not provide a price premium for sustainable produce, whilst schemes and programmes are voluntary and farmers willingness to carry out these activities is dependent on whether their beliefs remain in line with productivist regime or not.

The initiative Smart Farming, while it is a knowledge sharing platform conducive with sustainability, only features learning according to the beliefs of IFA, and therefore farmers are not confronted with any conflicting beliefs.

By enforcing such stable and dominant beliefs of productivism in the dairy industry, the rules and norms have remained entirely 'taken for granted'. There is a dominance of actors whose beliefs are aligned with the productivist paradigm, and these make up the majority. Policy-learning occurs more often through Teagasc who are conducting the most research, but due to their place within the Irish political structure, this learning is almost exclusively aligned with the productivist regime. There is rarely a confrontation of productivist beliefs with sustainable beliefs, particularly for farmers who are involved with knowledge-sharing programmes and demonstrations only through Teagasc, the IFA's Smart Farming and the co-operatives. This similarly rings true for the EPA who also are unwilling to advise against Government policy as they must follow political objectives.

2.2.3 Carbery Foods

Carbery itself plays a large part in the landscape in which this study takes place. Carbery Creameries (Bandon, Barryroe, Lisavaird & Drinagh) with Express Dairies (UK) established Carbery Milk Products in 1968. By 1991, Grand Metropolitan Hotels, who had taken over the Express Group in the mid 70's, decided to concentrate on their hotel catering and drinks business and to sell off their dairy product interest in the UK and Ireland, including their 80% share in Carbery Milk Products. The four members of Carbery Creameries who already owned 20% of the share capital of Carbery Milk Products combined and bought out the remaining 80% and so Carbery Group is now 100% owned by four Irish milk co-operatives based in West Cork. These co-ops are, in turn, wholly owned by their farmer shareholders. Unlike companies like Kerry group who became a publically limited company,

Carbery remains owned by the four West Cork co-op's. This is quite unique in the Irish Agri-Food landscape.

Indeed Carbery was referred to in an Irish Times Article (Irish Times, 4 West Cork Co-op's Should Get it Together) Friday April 24th, 1998) as "something of an oddity, even by the standards of the Irish dairy industry" and stated that "it is very profitable, has shown an excellent ability to diversify out a core cheddar cheese business and is also owned by four coops in West Cork who have themselves shown a great reluctance to merge despite the positive experience they share through their joint ownership of Carbery".

The Carbery annual report of 2020 highlights that the co-operative model is at the epicentre of Carbery in that they pursue economic viability and social responsibility in everything they do. Further it states that "farmers understand the challenges of climate change, their central role in addressing it, and are ready to act". However, Carbery operates similarly within a productivist paradigm as stated in their Sustainability Report 2018, in which they say that "the issue of sustainability and increasing environmental costs has the potential to undermine the growth potential of our industry. The primary objective for Carbery and its farmers is to turn this challenge into opportunity by implementing greater efficiencies leading to cost reductions, while enabling sustainable production growth". Once more, economic growth is at the centre of their mission.

However, consumer pressure has influenced the demands made by multinational firms for sustainable dairy produce. Indeed, society is becoming more conscious of issues such as climate change, and these demands are slowly being passed down the supply chain. In the 2018 Sustainability Report, Carbery state that:

"Demand for food has changed and consumers now wish for their food to be produced in a sustainable environment. For many the primary consideration is addressing climate change; for others it is about ethical procurement; for many more it is about social sustainability. The only difference is the priority that consumers place on these differing aspects of sustainability. More and more, people want to know where their products come from and how they're

made – and consumers increasingly need to feel confident they're not buying brands that conflict with their values”.

Indeed, the pressures of consumer demands may have the potential to lead to radical change. The dairy industry is completely dependent on consumer demands. While incremental changes have been applied already to meet these demands for more sustainable produce, such as through the Origin Green marketing campaign, it is reasonable to expect that eventually society will expose the lack of data and demand proof of real sustainability action. As the demand for sustainability increases, it can be expected change will be necessary in order to ensure the industries own survival. Such radical changes may then open a window of opportunity for policy in relation to the sustainable paradigm to finally reach farmers and begin to make an impact on the ground.

2.2.4 Alternatives to Productivism and Neo-Liberal Approaches

There are alternatives to productivism and neo-liberalism such as the Green Political Economy. Barry (Barry, 2015, p. 34) describes the Green political economy “as motivated by creating an economy as if we mean to stay around to enjoy it, not as a process of liquidating the planet, exploiting people, unequally distributing the fruits of that economic growth, and calling it “progress.” In terms of the critique of economic growth, green political economy questions undifferentiated, orthodox GDP measurements of growth, where growth is viewed as a permanent feature of an economy or a permanent economic objective.

In fact, neo-classical economics are so ingrained that often when we “are talking about “the economy” we are in fact, usually, talking about a particular mode of economic organisation, namely capitalism. Barry (Barry, 2015) refers to this as a category mistake i.e., the confusion and conflation of “capitalism” with the “economy.” He elaborates that when an “economist” is called to comment in the media: it is without exception a neo-classical economist who will (generally speaking) talk about (and defend) capitalism. Rarely, he says, do we hear non-neo-classical economists in our media, or if we do these are not accorded the label of

“economists” but “political commentators”. A green economic perspective makes the case for re-orientating the economy toward enhancing and being judged by its capacity to promote “quality of life,” “well-being,” “happiness” rather than orthodox economic growth. As the New Economics Foundation puts it, the purpose of economy should be to enhance the well-being of the citizens of the country, in a way that is socially just, and environmentally sustainable. That is, the level of economic growth achieved in an economy is not a sufficient measure of that economy’s success or failure to deliver prosperity to society. This is because economic growth does not, in itself, tell us anything about our quality of life” (New Economics Foundation 2008: 1–2).

A model of green political economy cast in terms of “economic security” has the advantage of presenting a positive and attractive discourse for addressing the problems of “actually existing unsustainability” (Barry, 2015). Using the language and analysis of economic security introduces ways of arguing and presenting the case for a less growth-orientated economy and high consumption society, which at the same time aims to raise quality of life while lowering inequality.

Barry takes this notion of economic security from a 2004 report by the International Labor Organization (ILO) entitled *Economic Security for a Better World*, which found that “economic security” coupled with democratic representation and equality were the main determinants of well-being, tolerance, and social stability (International Labor Organization 2004c). The report defines economic security as composed of basic social security, defined by access to basic needs and an infrastructure pertaining to health, education, dwelling. The report found that people in countries that provide citizens with a high level of economic security have a higher level of happiness on average, as measured by surveys of national levels of life-satisfaction and happiness. The most important determinant of national happiness is not income level—there is a positive association, but rising income seems to have little effect as wealthy countries grow wealthier. Rather the key factor is the extent of income security, measured in terms of income protection and a low degree of income inequality” (International Labor Organization 2004b: 1).

An economic system that has only two options—continual growth or collapse—cannot be stable or secure. On the one hand, this type of economic system is unsustainable, that is, it is simply biophysically impossible to achieve continual economic growth. On the other hand, capitalist stagnation brings with it its own dangers, that is, no-growth is not socially desirable or politically acceptable (Jackson 2009). Economic stagnation—as with the global economic crisis experienced since 2008—is associated with high levels of unemployment, social dislocation, disinvestment, and a lowering of well-being.

It is the “myth” of exponential and permanent economic growth itself that is the problem and needs to be abandoned. Barry (Barry, 2015) states that rather than focusing our energies on increasing capitalist production and orthodox economic growth, what we need to be doing is exploring ways of increasing human flourishing. This echoes the views of Ehrenfeld covered in later parts of this research work.

Thus, this suggests that economic growth is not to be somehow rejected “in principle” as being “intrinsically” bad or wrong, but is to be seen in terms of a society’s evolution over time, and as a policy that needs to be periodically reviewed, rather than a “locked-in” or permanent feature of a society.

Green political economy thus indicates the need for a paradigm shift in how we understand the economy and the organization of the economy away from orthodox, undifferentiated economic growth as a permanent feature of the economy toward seeing it as a contingent and historically specific feature, a step toward a green, sustainable economy organised around the objective of increasing the ecological efficiency of human flourishing (Barry, 2015). And even though recent global crises (e.g., the banking crises, economic failures, austerity and health inequality, climate change, environmental degradation, immigration flows) have led to questioning of the neoliberal agenda, this ideology persists.

Overall, then, there have been a number of policies, programmes and influences which have made an improvement on mainstreaming the concept of sustainability but ultimately it has continued with a productivist paradigm, wrapped up in a neo-liberal approach. Ultimately, we need to remember that economic growth is, after all, a means not an end, as we live in societies with economies, not economies with societies.

The analytical insights of the Green Political Economy are very relevant to Irish Agriculture and particularly to the dairy sector as plans and programmes for the future of this sector are embedded in a growth mentality, including an increase in herd and farm sizes and a push towards ever increasing production. This appears to be at odds with the sustainability agenda in terms of reducing herd sizes (and associated greenhouse gases) and the productivist nature of the industry. The concepts explored by this non-orthodox approach show a potentially different pathway for Irish agriculture in its' drive towards sustainability, which is worth considering.

This thesis will focus on the individual farmers and the influence of peer-to-peer communication. It is important, however, to take notice of the research covered briefly by this section and the existing webs of power and influence within Irish farming into which Irish farmers are locked. Having spent some time on this topic, the thesis will now move on to discuss the meaning of sustainability and associated terms.

2.3 Sustainable Development

'Our Common Future', a report which was released in 1987 by the World Commission on Environment and Development (WCED) chaired by Gro Harlem Brundtland, stated that development is only 'sustainable' if it 'meets the needs of the present without compromising the ability of future generations to meet their own needs' ((WCED), 1986, p. 8). This concept of sustainable development launched by the WCED was a global concept to guide policies orientated to balance economic and social systems and ecological conditions. The WCED paradigm of sustainable development advocates that the environmental and social implications of economic growth must be included in decision-making processes (Seghezze, 2009, pp. 539-536).

It is also often represented by the 'triple bottom line' of economy, environment and society or a 'triangle' formed by People, Planet and Profit (the three P's), with Profit sometimes replaced by the more moderate 'Prosperity'.

Hopwood et al. (Hopwood, Mellor, & O'Brien, 2005) believe that the widespread support for the concept of sustainable development was an important shift in understanding relationships of humanity with nature and between people. They go on

to say that it is in contrast to the dominant outlook of the last couple of hundred years, that has been based on the view of the separation of the environment from socio-economic issues. For most of the last couple of hundred years, the environment has been largely seen as external to humanity, mostly to be used and exploited, with a few special areas preserved as wilderness or parks. Environmental problems were viewed mainly as local, they suggest. This view was linked with the development of capitalism, the industrial revolution and modern science (Hopwood, Mellor, & O'Brien, 2005, p. 38).

As Hopwood et al. point out, sustainable development, although a widely used phrase and idea, has many different meanings and therefore provokes many different responses. In broad terms, they agree that the concept of sustainable development is an attempt to combine growing concerns about a range of environmental issues and socio-economic issues. Sustainable development, they say, has the potential to address fundamental challenges for humanity, now and into the future. However, they say, it needs more clarity of meaning to concentrate on “sustainable livelihoods and well-being rather than well-having, and long term environmental sustainability, which requires a strong basis in principles that link the social and environment to human equity” (Hopwood, Mellor, & O'Brien, 2005, p. 38).

Redcliff et. Al. agree that the simplicity of this approach is “deceptive, and obscures underlying complexities and contradictions.” (Redcliff, 2005, p. 213). The authors go on to say that there are still confusions that characterise the discussion on sustainable development. This confusion, the authors say, surrounds what is to be sustained and that different discourses of sustainable development sometimes fail to address this (Redcliff, 2005, p. 214).

2.4 Sustainability

The term ‘sustainability’ is often considered a synonym of sustainable development. Similar to sustainable development, Christen and Schmidt (Christen & Schmidt, 2012) believe that in both science and practice, there are a multitude of understandings and conceptualisation’s of sustainability and because of this, it loses its power toward action. The authors believe that there is not a disagreement at this stage, that sustainability is one of the leading models for the development of society. However, the principal question of ‘what is to be sustained?’ is open to understandings which are based on vague assumptions or dogmatic opinions, they claim. They argue that

the current difficulties in the sustainability discussion is due to the gap between the social science type of understanding and the natural science/engineering understanding (Christen & Schmidt, 2012).

This is echoed in the book 'Transdisciplinary Perspectives on Transitions to Sustainability', where the authors stress the need for a transdisciplinary approach to sustainability and the need for interdisciplinary research as a necessary precondition to successful sustainability research (Byrne, Mullally, & Sage, 2017).

Byrne (Byrne, 2017) believes that sustainability is a property of the complex system of which the human race is only a part. And although, we have come to know a great deal about that system, we still understand little about it, he says. He believes that popular conceptions of sustainability typically see it in terms of competing and overlapping requirements of respective economic, social and ecological domains. Representational models of sustainability (such as Brundtland) therefore incorporate these domains, for example, by the intersection of three interlocking circles, or as an entablature which rests on three supporting pillars.

The different ways in which 'sustainability' is approached, then, reflects quite different underlying patterns of everyday behaviour (or underlying commitments), Redclift says (Redclift, 2005). People define their 'needs' in ways that effectively exclude others from meeting theirs, and in the process can increase the long-term risks for the sustainability of other peoples' livelihoods. Most important, however, the process through which we enlarge our choices, and reduce those of others, is largely invisible to people in their daily lives, although understanding this process is central to our ability to behave more 'sustainably' (Redclift, 2005, p. 215).

Ehrenfeld argues that the most important characteristic of sustainability is that the word, by itself, refers to nothing in particular. It only gathers meaning in a practical sense, he says, when that output is named. In other words, from his viewpoint, sustainability means "absolutely nothing in practice without naming the end being sought". This dissonance, he believes, has serious consequences because it leads to a term that can mean different things to different people depending on the static outcome they seek. For Ehrenfeld "It has lost any real meaning". (Ehrenfeld & Hoffman, 2013, p. 16).

In essence as Bell and Morse say “recognising that sustainability means different things to different people is at the heart of the matter” (Bell & Morse, 2008, p. 96). Therefore, this thesis asks an interesting question of what sustainability means to farmers.

2.5 Sustainable Development Goals

In more recent years, the Intergovernmental Negotiations on the Post 2015 Development Agenda have led to the adaptation of the 2030 Agenda for Sustainable Development (UN 2015). The 2030 Agenda for Sustainable Development put forward a broad and ambitious agenda covering a wide range of interrelated goals, including poverty eradication and economic growth, social inclusion, environmental sustainability and peace for all people by 2030. Part of the agenda was the formulation of the Sustainable Development Goals (SDGs). These goals follow the grand preamble of the United Nations that it is ‘resolved to free the human race from the tyranny of poverty and want to heal and secure our planet’ (UN 2015). There are 17 goals, accompanied by 169 specific targets meant to advance the goals in a concrete way.

An analysis of the Sustainable Development Goals (SDGs) demonstrates the interconnectedness of the goals and targets, with various nexuses identified among sectors, such as the education, gender and health nexus; the water, energy and food nexus; and the climate, land, energy and water nexus (Jardali, Ataya, & Fadlallah, 2018, p. 1).

As a framework, the SDGs extend the previous Millennium Development Goals (MDGs) in many ways, but particularly by seeking to profoundly link the social, economic and environmental aspects of goals (Stafford & Smith, 2016).

Bierman et. Al conclude that even though the SDGs draw on earlier efforts such as the MDGs, there is no doubt that the level of ambition and comprehensiveness of the new goals surpasses all existing attempts at global governance by goal-setting, making the SDGs one of “the most intriguing new global initiatives in the area of sustainable development and environmental policy” (Biermann, 2017, p. 29).

The idea of the SDGs has quickly gained ground because of the growing urgency of sustainable development for the entire world. Almost all the world’s societies acknowledge that they aim for a combination of economic development, environmental

sustainability and social inclusion, but the specific objectives differ globally, between and within societies (Sachs, 2012, p. 2206).

As illustrated in the UN documents, Kopnina (Kopnina, 2017, p. 2) says that equitable economic growth is seen as a panacea for sustainability challenges. Yet the idea of 'sustainable economic growth' has been largely criticized as oxymoronic in select literature. She goes on to argue that "academics have been tracking the rebranding and packaging of unsustainable endeavor under the banner of economic growth, which fuels a massive expansion of industrial activities, competition for increasingly scarce resources, and related social inequalities and upheaval".

This brings us to our next section which will discuss the focus on economic growth and what has been called in some circles the 'Business as Almost Usual' approach to sustainable development.

2.6 Business as Almost Usual - Eco-Efficiency, Consumerism and Reducing Unsustainability

Many authors believe that sustainability is in fact about maintaining the status quo of current levels of consumerism and that intrinsic in this is that the goal is to reduce 'unsustainability' rather than make any radical changes, to how the economy currently works.

For example, Byrne (Byrne, 2017) reflects that the construct of sustainability does not recognise the presence of physical limits which define a world which has finite resources that is inhabited by a growing population. But the popularity of how sustainability is represented, he says, presents an insight into the worldviews and values which underpin them. He goes on to say that "while they provide a nod in the direction of unsustainability in recognising that there is or may be a problem, they do this only in a way that can at best facilitate a reduction in unsustainable practices, while maintaining the continuation of business as usual, as opposed to encouraging the mobilisation of any radical or transformative change". In viewing the three domains as essentially separate dimensions, it allows for any amount of 'wiggle room' he says and "a concurrent shifting of the burden between domains in the guise of 'externalities' – that is, non-economic entities whose values are inherently normative and are subject to arbitrary weightings to suit the occasion/framer". Such narratives, he believes,

represent a dangerous delusion; “acting as soothing lullabies aimed at drowning out the background cacophony of unsustainability”. (Byrne, 2017, p. 41).

Byrne goes on to say that dominant models of sustainability remain not just subservient to the imperative growth inherent in the dominant model of economics which pervades our ever more globalised world, but help promote and maintain it. In practice, this means that people are always encouraged to consume more. This is regardless of whether, as Byrne says, consumers might go for the ready to consume, guilt-free, sustainability-imbued, best in class’ product or choose a ‘sustainability-free’ option, or elect for something in between. In reality, it is this growth necessitating model of economic reality that is in fact striving to be sustained, above all else, he believes (Byrne, 2017).

John Ehrenfeld (Ehrenfeld & Hoffman, 2013, p. 53) suggests that the way businesses advertise and publicise their (green) programmes “lulls the public into believing that the firms are taking care of the future .. but almost everything being done in the name of sustainability entails attempts to reduce unsustainability”, he claims. Reducing unsustainability, he says, although critical, “does not and will not create sustainability”. The dominant conception of sustainability, is thus aligned with the dominant conception of progress, he believes.

Interestingly Byrne states that if sustainability is described as the ability of systems (whether these be social, ecological, economic or some combination of these) to endure, then the question may well be asked: what is it that one is trying to sustain/endure? He states that if it is accepted that the current (socio-economic-ecological) system, which promotes limitless ongoing consumptive growth, is on an unsustainable trajectory, then there is a good basis to argue that this particular social construct requires disruptive change. (Byrne, 2017)

Ehrenfeld believes that of all aspects of society (including governments, businesses, NGOs, foundations etc.) business has taken the strongest role, embracing the concept of sustainability as an issue of corporate strategy. But he believes that, in so doing, sustainability has become a slave to business interests. He goes on to argue that it has become a label for strategies actually driven by standard economic and institutional mechanisms around efficiency. As a result, he says, sustainability exists as a demoted and diluted notion, one that is far from its meaningful content.

Businesses, he says, strive to prove ‘the business case’ for sustainability, and in doing so, fit sustainability into the dominant beliefs embedded within the market economy, which he believes are, those very beliefs that caused the problem in the first place. He believes that ‘present day efforts at sustainability have been corrupted and subverted by utilitarian values that turn them into a marketing pitch’ (Ehrenfeld & Hoffman, 2013, p. 2).

Ehrenfeld goes on to argue that what companies really are doing when they promote sustainability is, at best, incremental in scope. At worst, he says “they are creating harm by fooling us into thinking we are solving the problem”. He believes that corporate sustainability programs are virtually all based on efforts relative to what they would have done according to Business As Usual (BAU). He calls this Business As Almost Usual (BAAU) (Ehrenfeld & Hoffman, 2013, p. 51).

He points out that sustainable is an adjective and goes on to say that sustainable anything is all about the anything; in sustainable development, it’s all about development. Sustainable business refers to what the business is going to do to keep itself going. He says that the way that businesses and other institutions use the word, it’s quite clear that they have no idea of what it is they want to sustain except the status quo. Ehrenfeld proposes a different perspective on sustainability which is of particular interest to this thesis. Flourishing, as the fundamental concept of Ehrenfeld’s work is particularly borne out in later findings chapters in this thesis and therefore, the following paragraphs are devoted to a somewhat detailed discussion on same.

2.7 Sustainability as Flourishing

Ehrenfeld believes that society needs a new ‘paradigm’ and he proposes flourishing as a metaphor for the bundle of things that make life worth living and produce well-being. He offers the following definition “sustainability is the possibility that humans and other life will flourish on the earth forever” (Ehrenfeld & Hoffman, 2013, p. 16).

What he describes is a radically different story than the Brundtland Commission’s definition of sustainable development. He says that his construct of sustainability as flourishing invokes a different set of characters, seeks a different set of outcomes, and utilises a different way of thinking (Ehrenfeld & Hoffman, 2013). He recognises that the Brundtland Report offers what has become the iconic definition of sustainable development (development that meets the needs of the present world without

compromising the ability of future generations to meet their own needs) and that inherent to the core of this is equity (in the sense of making clear that the affluent nations of the world must act to ease and eliminate the poverty rife in much of the world). However, he believes that the overwhelming central approach of the affluent nations to adhere to the Brundtland definition is “to try to hold on to the world as we have it by doing things better”. So in the end, it is fundamentally based on and promotes an eco-efficiency argument, he says. Though critically important, this type of approach will not move us toward sustainability, as it rests on the same economics-based paradigm that created the situation it aims to correct, Ehrenfeld says. He concludes that the problem is that we are trying to solve all the apparent problems of unsustainability by using the modernistic frame of thinking and acting that has created the meta-problem of unsustainability in the first place (Ehrenfeld & Hoffman, 2013, p. 19).

Ehrenfeld says that sustainability, is simply a property of some system to keep “producing whatever it is you want”. He says that the key to doing something about sustainability is that you have to first say what you want to sustain. He says that human beings need the system in which we live, Planet Earth, to run in such a way that human beings and all other life are going to flourish.

His approach to sustainability is what he calls flourishing. He describes flourishing as “the result of acting out of caring for oneself, other human beings, the rest of the ‘real, material’ world and also for the out-of-the-world, that is, the spiritual or transcendental world. Attending to these four essential domains of care is what makes us distinctly human, Ehrenfeld says. It means tending to family, for example, according to an authentic, self-conscious of what matters over time. “So we have to focus on the social systems in which we are a part (our culture) and the natural systems in which we are embedded.”, he says (Ehrenfeld & Hoffman, 2013, p. 16).

Ehrenfeld believes that sustainability, as flourishing, demands that the people of the world stop consuming in the way that they do today. The shift from quantity to quality is a critical and necessary move in keeping the world from falling into discord and decay. He suggests that “we have to change the economy toward one that is not built on growth as its central premise” (Ehrenfeld & Hoffman, 2013, p. 68) and that “we

need to find a way to move away from the core of our central belief that more money and more material goods will make us happier” (Ehrenfeld & Hoffman, 2013, p. 64).

In other words, it means that human beings need to focus less on material wealth and concentrate on caring, being and connection which leads us to the next section.

2.8 Continuity, Spirituality and Caring

Ehrenfeld believes that not only have the measures of success in our society changed but also the very terms of a life well lived. For a person who can live within the materialistic illusions, he states that “the career has to be perfect, the spouse has to be perfect, the children have to be perfect. But hidden behind this idea of perfection is a much diminished set of values” (Ehrenfeld & Hoffman, 2013, p. 31). He believes that the human race agonises over perfection and we dedicate a lot of time, energy, and money to it. In making ourselves materially rich, he says, “we are making ourselves existentially and psychologically poor” and that this situation is “completely unsustainable”. Consumption and accumulation (having) now define a large part of what it means to be human, he states (Ehrenfeld & Hoffman, 2013, p. 69).

But the key question that arises from all of these theories is, how do we change our notions of consumption and their tight connection to personal fulfilment and satisfaction? To be truly authentic, Ehrenfeld says, we need a shift from a view of ourselves first from one of Having to one of Being, and second from one of Needing to one of Caring.

In his view ‘we spend so much time on the treadmill of wage work, we have no time left to focus on what we care or should care about’ (Ehrenfeld & Hoffman, 2013, p. 15). This gap, he believes, creates suffering which shows up as psychological distress, unfulfilled relationships and unhappiness. In fact, he argues that we have become addicted to all that is “blocking sustainability”.

The author believes that the more human behaviour departs from the true and complete understanding of the workings of the world, the larger undesired results will become.

Ehrenfeld states that sustainability as flourishing could come much faster if we would put spirituality back into the place it belongs and deserves. He describes spirituality as practices in daily living that reflect a sense of connectedness to the world. It can,

he says, encompass belief in immaterial realities or experiences of the immanent or transcendent nature of the world that can help a person to discover the meaning of their Being, and the deepest values by which we can live (Ehrenfeld & Hoffman, 2013).

Ehrenfeld further reflects on the concepts of care and caring and their importance to spirituality. He describes care as “a consciousness of our interconnectedness with the world (the web of life) and the historic recognition that well-being depends on acting to keep these relationships in a healthy state. Care underpins the development of effective behavioural habits that keep these relationships satisfied. Caring interpreted this way, is the fundamental foundation to explain human Being – the experience of living” (Ehrenfeld & Hoffman, 2013, p. 84).

In a similar vein, Kieran Keohane (Keohane, 2017) believes that a “fundamental and universal saving power is the desire for continuity; the desire to ‘live on’ through continuity with ancestors and descendants.” (Keohane, 2017, p. 165). He says that “one of the most characteristic symptoms of social pathology in contemporary civilisation is the fantastic quest for life: for longevity; for the elixir of life in one form or other” (Keohane, 2017, p. 166). He believes that there is a very serious point to be uncovered from this, which is the persistence of the deep human need for continuity, the desire to live on through one’s descendants and grandchildren, and the interest in a sustainable future world in which there could be a sustainable future intergenerational community.

He describes this as a yearning for our lost continuity which he elaborates to mean continuity with one another; continuity with divided parts of our inner selves; continuity between our private personal selves and collective social selves; continuity between our individual and social selves with nature; continuity with past, present and future; continuity between temporal and spiritual planes of being. This is anthropologically a universal deep human need, he believes (Keohane, 2017).

2.9 People and Place

Seghezze also believes that the suitability of the WCED (the World Commission on Environment and Development) paradigm to explain and solve environmental, social and economic problems needs to be reconsidered. He proposes an alternative sustainability triangle formed by ‘place’, ‘permanence’ and ‘persons’ (a proposed new three p’s) (Seghezze, 2009, p. 540)

He describes these as:

- a) Place, which he describes as the three dimensional physical and geographical, but also culturally constructed space where we live and interact and that this should be more adequately represented in a sustainability paradigm
- b) Permanence, which he says, has been largely neglected in the sustainability debate, in spite of the widespread recognition of the potential long-term effects of our actions, and all the inter-generational justice rhetoric
- c) Persons, which he describes as, a symbol of people as individual human beings and not as undifferentiated members of society, has been all but excluded, he says, from the WCED notion of sustainability.

Similarly, Escobar (Escobar, 2001) suggests that the definition of any alternative development paradigm should 'take into account place-based models of nature, culture and politics'. Places are more than just empty geographical spaces, he says. They contain what Macnaghten and Urry (Macnaghten & Urry, 2000) call the spatialised, timed, sensed and embodied dimensions of nature. Places are therefore a source of identities and behaviours. They incorporate notions of culture, local ways of life, and human physical and psychological health. Place can be constituted by a number of locations distant from one another. This shared territory might be an important ingredient in social cohesion, as studies on mobility, networks and migration have suggested (Urry, 2002). Place is, to a certain extent, a social construct that helps people build a sense of belonging to a given culture. In the findings chapters later in this work, we will see the importance of place borne out in the farmers' stories.

2.10 The Anthropocene, Planetary Stewardship and Nature

One of the fundamental aspects of sustainability is Nature and a term that has come to the fore in recent years in relation to this is called the Anthropocene.

The Anthropocene is a scientific notion, grounded on geology and Earth-system science, that suggests that human beings have colonised nature to a degree that has irreversibly altered the functioning of planetary systems. As a result of this, social and natural systems have become 'coupled'." Manuel Arias-Maldonado states that the rise the Anthropocene cannot be ignored by environmental sociologists if a realistic

understanding of sustainability is to be produced (Arias-Maldonado, December 2015, p. 1).

The Anthropocene is used to denote the human-driven age of the planet. A closely related term is 'planetary boundaries' – the idea that human activity is pushing important global ecosystem functions past a dangerous threshold, beyond which the earth will encounter abrupt potentially devastating outcomes for human well-being and life generally.

Some researchers present the Anthropocene concept itself as a new 'metaphor'. Anthro-po-cene is a hybrid term, forging a new relation between nature and humanity by combining the familiar notion of a geological 'cene' with a term for humans, upending our assumption that we exist within a non-human geological context (Rickards, 2015).

On the one hand, the Anthropocene is a given historical period during which certain events have taken place. On the other, the Anthropocene is a result, the consequence of those socio natural events and processes. In other words, it is both a chronology (marked by the anthropogenic influence on natural systems during time) and a given state of relations between society and nature. One that, in fact, blurs their separation. Manuel Arias-Maldonado says that scientists are suggesting that natural and social systems are now coupled, since the extent of the anthropogenic influence on ecological systems and natural processes is unprecedented. This shift knows a large number of manifestations, among which climate change is the most popular one. The author argues that environmental sociology has to take the Anthropocene seriously, especially when dealing with sustainability." (Arias-Maldonado, December 2015, p. 2).

The 'Anthropocene' conveys the sense that humanity has become a global geophysical force, equal to other natural processes acting upon the Earth system.

Lidskog and Waterton (Lidskog & Waterton, 2016, p. 397) describe the key elements of the Anthropocene as:

- i) that earth itself is a single system within which the biosphere is an essential component
- ii) that human impact is global and accelerating, now threatening the fundamental life process of earth

- iii) that this change is traceable geologically, implying a new geological epoch, ‘the Anthropocene’;
- iv) that there is a need to radically change current human activities in order to avoid this threat.

The narrative seems to be that earlier humans had modified ecosystems but that they had never completely transformed them. Now, it is claimed that the chemical composition of the atmosphere and the oceans have fundamentally changed. It is no longer only restricted areas that are thought to be affected, but the entire biosphere and all ecosystem functions.

The main idea, simply put, is that humankind should not exceed the newly constructed and quantified limits defined by earth scientists. Within these boundaries is demarcated a safe operating space for humanity. If these thresholds are crossed, it is thought that humanity will enter into a zone of uncertainty where earth’s life support system is threatened.

What is of importance to this thesis is the concept of stewardship within the discussion on the Anthropocene as the reader will see that this is borne out in the farmers’ stories in later findings chapters.

Rickards (Rickards, 2015, p. 285) say that the different metaphors arising out of the Anthropocene idea reflect and revitalise ancient myths and theological debates about humanity’s role in the world. As part of this, the author points to a major Anthropocene metaphor – humans as planetary stewards and which resonates with the other major Christian model of the human-earth relationship – stewardship.

Hamilton (Hamilton, 2017) elaborates that humans are undoubtedly a part of, and drastically affect nature. However, he points out that notions of planetary stewardship, responsibility, accountability, enfolding and intimacy etc. are only one side of the entanglement coin. He says “If we are truly entangled beings along quantum lines, we cannot choose what to be entangled with, or how. We simply are. Yet, if this is the case, we must also be equally entangled with death, destruction, catastrophe, guile etc. And yet despite this, it is stewardship, morality, and ethical responsibility in the Anthropocene that (rightly) rises to the fore of our ethical compass and scholarly debate” (Hamilton, 2017, p. 580).

2.11 Summary

This chapter began by providing a background to Irish farming and the political economy surrounding agriculture including ‘lock-in’ factors for Irish farmers. The section highlighted the productivist paradigm of Irish agriculture and how farmers do not have sole control of their farming practices but operate in a setting and context that they did not create, in terms of who has political power, who has control over resources and in a broader sense what infrastructural and technological options are available.

The chapter went on to highlight the many ways in which sustainability is viewed and its relationship with other key concepts and the following highlights some of the key points from this review. It is important to note that these points are often competing, overlapping and contradictory and serves to confirm the complexity of understandings on the concept.

Sustainability is:

- a) Taking care of this world’s needs whilst not compromising the needs of the future generations and the importance of continuity
- b) Sustainability incorporates economics, environment and social equity, the triple bottom line
- c) Sustainability is about Business as Almost Usual (BAAU); it is about sustaining what we already have but trying to do it more equitably whilst not damaging the natural environment.
- d) Sustainability is about radical change, decreasing materialism, consumerism and capitalism (and the concept of flourishing)
- e) Sustainability is about human’s relationship with nature and the concept of stewardship
- f) Sustainability is about flourishing and the importance of spirituality, caring and connectedness
- g) Sustainability is about the importance of nature

- h) Sustainability is about the importance of place
- i) Sustainability is about reversing the push towards greater intensity in farming practice in Ireland, towards one oriented towards multi-purpose farming

CHAPTER 3: LITERATURE REVIEW

3.0 Introduction

In this study, farmers produce ten digital stories which are then analysed in terms of farmers' understanding of the meaning of sustainability (concepts we have learned about in the last chapter). What Digital Storytelling is and the methodology used (arts-based methodology) is covered in the next chapter on methods. The stories produced were shown to other farmers and their thoughts and feedback on same were collected and analysed. The reason for doing this was to address one of the over-arching questions of this thesis in terms of the usefulness of communicating based on peer-to-peer, non-expert, bottom-up and emotional communication. The first section in this literature review will therefore focus on communication approaches so as to put this research in to context. As the sample of ten farmers is relatively small, I wished to measure my findings against a wider cohort of 193 neighbouring farmers, in terms of similarities and differences. The purpose of doing this was to investigate whether the results of the narrative analysis of the ten stories could be inferred to the wider group. This literature review provides an overview of social and psychological constructs which I have selected as a useful method to compare the research participants in this aspect of the study.

This chapter is divided up into the following two sections:

Section A: Communication Approaches and Change

Section B: Social and Psychological Constructs

3.1 Section A: Communication Approaches and Change

The next section reviews the academic literature in relation to communication approaches and changing behaviours and practices. This relates to the part of the research where the digital stories made by farmers are shown to neighbouring farmers and they are asked a range of questions in relation to same (Chapter 8).

3.1.1 Changing Behaviours and Practices

Over the last 40 years, numerous attempts have been made to construct models of human behaviour that identify its determinants in order that it may be directed into more pro-environmental channels. Specifically, such models have looked to individuals' beliefs, attitudes and values as predictors of behaviour. These models

suggest that if only pro- or anti-environmental beliefs could be identified and modified, behaviour might be changed. Central to this approach has been the assumption that behaviour is 'the outcome of a linear and ultimately rational process' of decision making undertaken by more or less rational individuals'. (Hargreaves, 2011, p. 81)

Bamberg et. al (Bamberg, Ajzen, & Schmidt, 2003) argue that a major reason why such models have received so much attention is because they treat attitudes (and the same essentially applies for values, beliefs, needs and motivations) as 'situation invariant orientation patterns'. In short, if the necessary cognitive components can be identified and modified, behavioural changes will cascade across contexts throughout all areas of an individual's lifestyle. More recently, however, it has been recognized that individuals do not exist in a social vacuum and, indeed, that in some cases the surrounding context overrides all of the cognitive factors included in the models. Rather than challenge the basic assumption of the models that individual decision making is 'maladaptive' and in need of correction, however, such insights have instead led to the gradual incorporation of various proxies for content (e.g., as social norms, social networks or surrounding infrastructures) as yet more variables in individual decision-making processes.

More recently, the contextual sensitivity of such approaches has been enhanced in social marketing interventions that seek to identify and remove real and perceived contextual 'barriers' and then tailor messages to carefully selected audience segments in order to create new social norms that, it is hoped, will motivate individuals to adopt the desired behaviours.

However, Shove (Shove, 2010) has argued that such an approach is fundamentally flawed and in fact serves to legitimize, rather than challenge, a whole range of unsustainable social conventions. In particular, she argues that such approaches are excessively individualistic and fail to appreciate the ways in which, variously, social relations, material infrastructures and context are intrinsic to the performance of social practices and not merely variables among many others within individuals' decision-making processes. More recently, an emerging approach based around ideas and theories of social practice has sought to address many of these shortcomings. Hargreaves suggests that existing attempts to change behaviour rest

on a narrow view of social change. Further, he suggests that close examination of behaviour change processes as they occur in situ reveals many more aspects and complexities of daily life, than existing approaches capture. Theories of social practice are proposed as offering a broader and more holistic conceptualization (Hargreaves, 2011, p. 80).

In contrast to conventional, individualist and rationalist approaches to behaviour change, social practice theory de-centers individuals from analyses, and turns attention instead towards the social and collective organization of practices – broad cultural entities that shape individuals' perceptions, interpretations and actions within the world.

In social practice, anti- or pro-environmental actions, and more or less sustainable patterns of consumption, are not seen as the result of individuals' attitudes, values and beliefs constrained by various contextual 'barriers' but as embedded within and occurring as part of social practices. In turn, the performance of various social practices is seen as part of 'the routine accomplishment of what people take to be 'normal' ways of life (Shove, 2004).

Social practice theory thus diverts attention away from moments of individual decision-making, and towards the 'doing' of various social practices and the inconspicuous consumption they entail. Further, individuals are themselves removed from centre-stage and instead become the 'carriers' of social practices, carrying out the various activities and tasks that the practice requires. As individuals pass through life, they come into contact with, get recruited to, have 'careers' within, and occasionally defect from a wide variety of different practices. Importantly, practice theory emphasizes that it is through these engagements with practices that individuals come to understand the world around them and to develop a more or less coherent sense of self. This does not, however, render individuals as passive and beholden to the dictates of practice, but instead conceives of them as skilled agents who actively negotiate and perform a wide range of practices in the normal course of everyday life.

Shove and Pantzar's (Shove & Pantzar, 2005, p. 83) understanding of practices is as assemblages of images (meanings, symbols), skills (forms of competence, procedures) and stuff (materials, technology) that are dynamically integrated by

skilled practitioners through regular and repeated performance.”. Bringing about pro-environmental patterns of consumption, therefore, does not depend upon educating or persuading individuals to make different decisions, but instead on transforming practices to make them more sustainable”.

Social practice theory directs research attention towards the practical accomplishment of ‘doing’ of everyday practices. This view, raises a series of radically different questions about how to create more sustainable patterns of consumption. The focus is no longer on individuals’ attitudes, behaviours and choices, but instead on how practices form, how they are reproduced, maintained, stabilized, challenged and ultimately killed-off; on how practices recruit practitioners to maintain and strengthen them through continued performance, and on how such practitioners may be encouraged to defect to more sustainable practices”.

In particular, Hargreaves points towards a focus on communities of practice and the relationships between them, because it is within these collective groupings that “practices are always being negotiated and transformed” (Hargreaves, 2011, p. 96).

This study will focus on the practices that farmers adopt on their farms and this will be addressed in the next chapter. To provide a context to this, the following pages will now provide a review of the literature in relation to communications.

3.1.2 Communication: From Transmission to Interaction

The transition towards a carbon-neutral society is a societal project – people have to be engaged, informed, be willing to participate and change their behaviour and practices. This will require social and behavioural change and this is becoming more central to international debates. There is extensive research which shows that understanding social and behavioural aspects is extremely important to environmental sustainability. However, changing behaviours and practices is neither automatic nor predictable. Moore (Moore, 2012) says that for change to be effective, social and behavioural approaches need to have an impact in the long-term (thus changing habits and values). She argues that it needs to involve not only individuals but systems and social practices across all levels of society.

In relation to climate change, it has been labelled a 'wicked problem' essentially referring to an issue so complex in nature that it has no obvious solution. It is an issue characterized by uncertainty, controversy, skepticism and often limited engagement by individuals, Gammelgaard Ballantyne says (Gammelgaard-Ballantyne, 2016, p. 329). The lack of engagement and action is often attributed to the fact that climate change is perceived to be distant in time and space, leaving many people to conclude that the changing climate does not pose a personal threat worthy of outranking other, more immediate concerns.

Driessen et. Al. (Driessen, Leroy, & VanVierssen, 2010) point out that much of human communication involves persuasion, to influence our attitudes and/or our behaviour. They believe that the transition to a sustainable future will require the vast majority of people to be persuaded to adopt different lifestyles and work practices. But if we are to change behaviours and practices, as individuals and as a society, how will we be persuaded? This study examines if digital storytelling could be one positive way to do this.

While attitudes or behaviour have been a policy focus, there has been a tendency to adopt an information deficit model, with the assumption that the right information will bring about a change in attitudes and eventually, the desired behaviour change. However, individuals do not always respond rationally to favourable economic choices or behave more sustainably, despite having positive attitudes. This has been well documented by behavioural economists, psychologists and other social scientists, in the literature.

Many initiatives to foster sustainable behaviour rely upon large-scale information campaigns that use education and/or advertising to encourage behavioural change. The review of the literature indicates that while education and advertising can be effective in creating public awareness and in changing attitudes, numerous studies show that behavioural change rarely occurs as a result of simply providing information.

The topic of environmental communication has become important in society and among social scientists which has resulted in the recent increase in communication from movies to grassroots movements. Despite this, Nerlich et. Al. (Nerlich, 2010) state that carbon emissions continue to increase both globally and domestically and

society continues to be vulnerable to climate variability. Furthermore, the authors believe that this raises questions about the effectiveness of current communication efforts, and the ability of audiences to implement change in response to these communications. “Not only the persuasiveness of the messages, but also the structure of society and considerations of the extent to which citizens are empowered to make effective change become important in this regard” (Nerlich, 2010, p. 97).

Nerlich et. Al. (Nerlich, 2010) believe that awareness of environmental issues has been raised, information has been provided, advice has been given, but acting on it in this context is a difficult decision to make for individuals, communities and governments around the world.

Many actors are involved in communicating about environmental issues to a variety of other actors: governments, citizens, communities, NGOs, businesses, international organisations and so on. Therefore, this kind of communication involves entities and couplings which are far from simple and entail many reciprocal dependent relationships. Communication can also be achieved by using a wide variety of channels and media, from text and talk, images and artistic installations, to films, documentaries and fun activities for children.

In order to address these challenges, recent research argues for a shift in focus from information deficits to issues of communication that prove as driving forces for engagement and learning. As such, the conversation has shifted from informing and educating the masses to engaging people with the issues.

However, many initiatives within environmental communication are still driven by an objective of addressing a public information deficit. This suggests that there is a tendency to conceptualise lay audiences as mere receivers of climate information from political or scientific expert sources. Gammelgaard Ballyantyne (Gammelgaard-Ballantyne, 2016) suggests that the way forward for environmental change communication research could be an exploration of how people constitute reality. She puts forward a number of questions, in relation to messages communicated which are particularly relevant to the subject of this thesis including:

- What do messages mean to different audiences and why?
- What causes people to engage or disengage with it?

- How do discourses contribute to the reproduction, maintenance or transformation of the perceived reality of sustainability?
- And how do advances within, for example, communications technologies affect what we can create and comprehend, and how do they function as facilitating tools for engagement?

Fleming and Vanclay (Fleming & Vanclay, 2010) support this reflection and encourage examinations of discourse in social settings as a means to understand behaviour as opposed to a methodology simply measuring attitudes, perceptions and opinions. In line with this, other authors within the field of climate change communication call for a stronger focus on sense-making processes. Such a focus does not necessarily disregard strategic communication such as information campaigns. It merely contends that communication cannot be understood correctly unless acknowledged as a constitutive process (Gammelgaard-Ballantyne, 2016).

Furthermore, Nerlich (Nerlich, 2010) point out that ‘while traditional media (such as newspapers) have been extensively studied, attempts to examine the construction of environmental issues in social groups, blogs and other new media are still relatively rare. They suggest that these sites of debate, engagement and knowledge construction offer new ways of thinking about environmental issues. The authors believe that this offers that each case can ‘develop its own logic of participation’ and new actors such as villages, parish councils and concerned individuals can develop their own voices and their own ways of harnessing science and technology” (Nerlich, 2010, p. 107). We will examine the use of digital storytelling in this context.

Research tends to fall into two camps. The first tends to emphasise the sender as the active part, conceptualizing communication as a secluded process of simply conveying a message to an audience. The assumptions seem inspired by simple behavioural theory where information is seen as a driver of behavioural change. This research tends to frame communication as an act of, for example, ‘conveying information, reducing ignorance and as dissemination of environmental information’ focusing on how communication (from the sender’s perspective) can change people’s behaviors or perceptions. The second and other end of the spectrum of communication approaches focuses on audience and audience interpretation that

argue for a perspective recognising the audience as active players in communication processes (Gammelgaard-Ballantyne, 2016).

In the 1970s and 1980s, many academics began to regard the linear transmission-oriented approaches (the first approach above) as somewhat naïve simplifications of the interactive context-dependent nature of communication. Consequently, the decades saw the emergence of a growing body of research and theories inspired by cultural and linguistic research and focused on subjective message meanings and the cultural and social influences of message interpretations. The influence of cultural studies meant that communication became associated with the invention and construction of meaning rather than the discovery of 'truth', acknowledging that the sender can never exert control over the meaning of the message content.

Schramm (Schramm, 1997) conceived communication as a process of encoding and decoding messages, which would lead to an appropriate response from the receivers. He focused on communication as a process leading to attitudinal or behavioural effects as a direct result of message stimuli. His theories are considered to have fostered the trend toward a paradigm shift, because of his approach to communication as a more dynamic process where communication simultaneously send and receive. The communication research that emerged in the first half of the 20th century, exemplified by Lasswell, Shannon, Weaver and Schramm, was later given the term 'the transmission paradigm', because it built on a linear-effects perspective of stimulus and response. From this viewpoint, communication is a tool that is used to transfer ideas or knowledge from one mind to another, focusing on the sender as the active part. This position sees communication as an act with a well-defined beginning and end, both of which can be measured.

Hall (Hall S. , 2006) contributed to the early critique of the transmission paradigm and stated that 'before a message can have an 'effect' (however defined), satisfy a 'need' or be put to a 'use', it must first be appropriate as a meaningful discourse and be meaningfully decoded. The asymmetric nature of message meanings was fundamental to Hall's communication approach, and his theories paved the way for new communication theories and approaches to emerge. With their emphasis on unravelling the complexities of signs and meanings, theories of semiotics played a key role in the development of this meaning-oriented approach to communication.

Many argue that semiotics, as the science of signs and meaning, can provide a framework and contribute to a deeper understanding of how communication operates.

The influence of cultural studies and meaning-oriented approaches to communication is said to mark the beginning of a new communication paradigm, often referred to as the interaction paradigm or the ritual or constitutive view of communication. Rather than assuming that meaning is immanent to the text, communication is seen as an ongoing cycle where focus is on subjective interpretations of messages. Text only contains meaning when interpreted, and the receiver is no longer conceptualised as a blank canvas. In effect, sender(s) and receiver(s) are acknowledged as equally active in the communication process or cycle.

Researchers now argue for an approach based on a better understanding of how to engage people at an effective, emotional level, for example, through exploration of bottom-up, non-expert climate perceptions rather than top-down, expert understandings. Indeed, the notion of expertise itself has been dissected and the distinction between expert and non-expert has been problematized, according to Nerlich (Nerlich, 2010).

Accordingly, the paradigm shift in communication theory illustrates a shift from functionalistic transmission-oriented approach to a perspective where all participants – senders and receivers – become co-authors or co-creators of meaning and where cultural and social sciences are recognised as an important influential factor. As discussed, this approach is rooted in the interaction paradigm and conceptualizes communication as a ‘constitutive process that produces and reproduces shared meanings’ (Gammelgaard-Ballantyne, 2016, p. 329).

Anne Gammelgaard Ballantyne goes on to argue that “although linear and information-centric models that assume ‘that the public are ‘empty vessels’ waiting to be filled with information which will propel them into rational action have influenced much public policy, these approaches are criticised for being inappropriate and ineffective, as they underestimate the complexity of learning and behaviour change” (Gammelgaard-Ballantyne, 2016, p. 337). In addition, she says that, communicators are encouraged to move from one-way communication, which presumes that

information will lead to rational action to perspectives of dialogue and reflexive engagement. This, she says, needs to accept the point that information is not synonymous with knowledge, and that 'sending messages' and 'educating people' are limited in their impact.

Communication could, then, be defined as the study of social reality as perceived by participants of that particular reality. Receiver and producer of communication are thus seen as equally active participants in (re)producing reality in a process that revolves around interpretations of symbols, that is, text or visuals.

Key in this perspective is a conceptualization of communication participants, senders and receivers, as co-creators of meaning. Furthermore, it changes the focus from an asymmetrical sender-orientated perspective to focusing, for instance, on how communication can facilitate reflection, engagement and learning.

The literature points to a need to be reflexive about assertions regarding communication rather than simply viewing it as a tool for conveying messages. She emphasizes conversational interaction and co-construction as core elements. This, in turn, she says calls for participatory research, where problems, issues, and solutions are explored from different perspectives, including the perspective of audiences (Gammelgaard-Ballantyne, 2016, p. 341).

However, the consensus within the field of communication theory to leave behind ideas supporting the transmission paradigm has not reached all corners of the climate change communication literature, where talks about 'disseminating information to the public' and assumption of more or less causal correlations between awareness, attitudes and behavior still exist.

Regardless of this paradigm shift, in 'traditional' communication planning efforts, communication is often approached through the lens of strategy, which means that communication ideally becomes a coordinated effort with a strategic aim, clear objectives, coordinated messages and media tactics, well-defined audiences, carefully considered time and resource management.

3.1.3 Visuals and Emotions

In attempts to engage people, communication needs to consider not only how to encourage rational public engagement with the environmental issue but also how to make the issues appealing, interesting and meaningful to the individual.

Graber (Graber, 2001) finds that most audiences are attracted by vivid information, which means that it is a) emotionally interesting and b) concrete and image-provoking and c) proximate in a sensory, temporal or spatial way. The authors note that data that is presented in an emotionally compelling way may be given greater consideration and more weight than data that is statistically more valid, more emotionally neutral. From a physiological and psychological standpoint, memories with strong emotions attached are both deeply embedded and easily accessible. Visuals, Graber argues serve as information shortcuts but can also cut through existing schema or preconceived notions to attract viewer attention. In addition, visual evidence triggers emotion, activating more areas of the brain and enhancing learning and recall information (Graber, 2001).

In his research on political advertising, Brader (Brader, 2006) states that symbols, images, music and other audio-visual cues act overtly and subliminally to elicit an emotional response by the audience.

But Brader also cautions that there are limits on the effects of emotional appeals, citing a study by Huddy and Gunthorsdottir in 2000 in which subjects were given an environmental flyer to protect a particular wildlife species. Different versions of the flyer depicted a cute or ugly animal or no picture. The cute animal flyer, a positive appeal, elicited a strong positive response in pro-environment respondents and a strong negative response in those who were not predisposed to support the cause. This suggests that emotional appeals can backfire. As Graber (Graber, 2001) notes, the effect of emotional accounts seems to be modulated by context and by the audience's existing views and predispositions.

3.1.4 Science, Knowledge and Understanding

The literature on science communication has seen a development from a strong 'science literacy' perspective over 'public understanding of science' to an emphasis on 'science and society' that highlights public participation, dialogue and

engagement with science as a way to democratize science (Gammelgaard-Ballantyne, 2016, p. 336).

Nierlich (Nerlich, 2010) suggest that there is much evidence for the growing contemporary importance of peer-to-peer, rather than top-down influence. Communication researchers also point to the role of charitable, voluntary and NGOs in exploring novel, artistic or creative ways of communicating on these issues which differ from the more didactic approaches favoured by official bodies.

An increased attention to the role of language and communication is urged upon scientists in a variety of papers and initiatives, where scientific communicators are encouraged to adapt their language to suit the tastes, meanings and concerns of ordinary people. Hassol (Hassol, 2011) suggests using metaphors and embedding these in stories. For example, the metaphor of age, she says, can be used to describe the difficulty of relating climate to weather. Although it is impossible to predict the age of death of any particular person, we can say with confidence that the average age of death for people in the United States is 77. She goes on to point out that climate, like the average age of death, is a statistical average that is predictable based on large-scale forces, while weather is subject to chaotic forces that make it inherently more difficult to predict.

However, Wynne (Wynne, 2008) points out that the pre-occupation of scientists to find the language of the common man or woman as a vehicle of public engagement is perhaps the latest manifestation of the older concern that the public is somehow deficient in knowledge.

Wynne suggests that it may be possible to conceive of a different model of communication and engagement which allows a more dynamic relationship to develop and enables participants to challenge entrenched assumptions, interests, power-structures, and imaginations and to be more fully cognizant of the capabilities of people to deliberate, discuss and deduce solutions independent of government interventions.

Further, the authors enter a plea to policy-makers, scientists and communicators to look beyond simple transmission models or public understanding models of the relationship between expert knowledge and 'lay knowledge'. They say these embody a limited view of the relationships between science and society and a limited

view of the public. They also say it produces a curiously truncated view of communications research as being about finding the right words and checking if people are listening.

Driessen, Leroy and Van Vierssen (Driessen, Leroy, & VanVierssen, 2010) point out the importance of scientific knowledge both in its fundamental form and also in its strategic and application forms and to the way it is interwoven with local, indigenous or implicit knowledge. They point to two essential characteristics of knowledge: its legitimacy and mobilising capacity. The first, legitimacy, they say is a decisive force regarding whether science is accepted as a guideline for action. Its acceptance, they say, does not depend on endorsements within a scientific discipline but rather on the social robustness of the knowledge, on its contribution as demonstrated in practice within a societal setting. Legitimacy, they say, is a necessary precondition for the capacity of knowledge and science to mobilise societies, a capacity, they believe, that must lead to greater resilience of society (Driessen, Leroy, & VanVierssen, 2010, p. 18).

Brondizio (Brondizio, 2016) ask if it is possible to approach the Anthropocene from the bottom-up, beginning with diverse social-ecological realities and working up to a global scale analysis, rather than the other way around? What new conceptual frames could motivate collaborative research on the relationship between narratives, values, cognition and behaviour underlying these changes?, they ask. The nature of these analytical problems suggests that a greater knowledge integration is a necessity rather than a choice.

In other words, they say that in order to advance new ways of analyzing complexity in social-ecological systems “we need to go beyond the recognition that actors, processes and structures are connected and systems are multi-scale and to recognise that global change research frameworks and narratives involve diverse perceptions of, and assumptions about, human-environment relationships and social relationships” (Brondizio, 2016, p. 323).

Driessen et. Al. (Driessen, Leroy, & VanVierssen, 2010) believe that academia no longer have a monopoly on scientific knowledge. Instead it has they say spread over many more producers: mainly private parties, who, operating in shifting networks, generated new, often strategic knowledge outside the classic scientific circuit. One

implication of this different ways of organising the production of knowledge, they argue is that, besides providing a guarantee of scientific quality, it is also necessary to provide a guarantee of its social caliber. In this way, they state that participation is not only promising but necessary. That authors believe that one reason why the knowledge provided exclusively by scientists and experts may be found wanting in legitimacy is that such knowledge is too generic; it is not specific and contingent enough. The authors recognise that where experts do make use of all kinds of general and explicit knowledge, what they do not use is the often implicit (layperson's) knowledge.

The positive aspect of this, they say, is that the input of that layperson's knowledge can be beneficial not only to the quality of the analysis and the approach, but, precisely in a context of scientific uncertainty, particularly to their legitimacy.

Incidentally, the time when it was all about layperson's knowledge has long passed, a shift that accompanied the far reaching distribution of all kinds of knowledge, and particularly the democratisation of access to knowledge, the authors believe. Now it is about citizen science. It is about knowledge that is mobilised and organised by citizens and that, in terms of quality and applicability, can pass the test of scientific validation with flying colours (Driessen, Leroy, & VanVierssen, 2010, p. 22).

Nerlich stresses the importance of engaging social networks and opinion leaders, and the value of a consistent message from policymakers (Nerlich, 2010, p. 102). The authors further suggest that in the future, it would be interesting to compare and contrast media coverage of government-sponsored climate change communication and the communication of climate change by activists. Here, the idea of an active policy of citizens deliberating and debating issues, generating their own languages and concepts and deploying new means of communication invokes the ideas in deliberative democracy studies (Nerlich, 2010, p. 103). This study on digital storytelling will focus on the language of farmers and the messages they relay in discussing sustainability on their farms.

The next section will focus on the use of signs, symbols, metaphors and narratives in environmental communication.

3.1.5 Signs, Symbols, Metaphors and Narratives

In the 1930s, the German psychologist Karl Buhler focused on linguistic signs among human beings as instruments that guide practical behaviour. As signals used in social life, every sign is at one and the same time a symptom (indicator, index) by virtue of its dependence on the sender (whose internal state it expresses), a signal by virtue of its appeal to the recipient (whose behaviour it controls) and a symbol by virtue of its assignment to the objects and states of affairs (to which it refers). And so every sentence is at the same time expression, appeal and representation. Applied to environmental communication one can observe that much effort and research has gone into honing the 'appeal' function of language.

Carey (Carey, 2009) defines communication as a symbolic process whereby reality is produced, maintained, repaired and transformed and further argues that the study of communication is the study of social processes wherein symbolic forms are created, apprehended and used.

Byrne, Mullally and Sage's (Byrne, Mullally, & Sage, 2017) recent narrative analysis focuses on narratives that construct myths around the issue of climate change. The study does not evaluate how narratives deviate from 'reality' but considers how particular storylines of climate change feature repeatedly across a range of articles and newspapers and how social groups imbue them with significance. The author's approach highlights the role that metaphors and discursive strategies have and credits a prominent role to storytelling in the media representation of climate change.

Drawing on articles from the years 2008-2012, Byrne, Mullally and Sage (Byrne, Mullally, & Sage, 2017, p. 11) reveal competing narratives that incorporate traces of three structuring metaphors: somnium, soma and somnambulism. Somnium, they explain, features a moment of transcendence where collectively humanity can rise above challenges and is recognisable, in statements that declare 'something needs to be done now'. The expression 'why won't we change' connects to soma, they say, and relates to variety of societal mechanisms that produce inertia (which resists collective action). Finally, somnambulism is the metaphor of sleepwalking where institutions and citizens collectively avoid confronting the scale of transformation that is required for a transition into sustainability. They continue to say that this perceived failure to confront the severity of the issue is often accompanied by calls that amount to needing 'to wake up'. The authors find that somnium and soma are

more prevalent in media narratives on climate change in Ireland than somnambulism and identifies five competing storylines as follows: 1) common future 2) feed the world 3) back to reality 4) contrarian denial and 5) a public establishment that won't wake up to the seriousness of the problem.

The 'common future', they say is a storyline that features references to the pope's 'human family' and how it needs to respect the planet as 'our common home'.

Furthermore, there are appeals to the 'judgement of God and history' such as by the Irish Green Party which in 2008 describes the Kyoto Protocol coming into effect as 'a historic moment for the world'. This narrative, they say, also includes 'a global ethics of responsibility' exemplified by UN Secretary General Ban Ki Moon's warning in 2008 against 'looking inward rather than toward a shared future'.

A second key narrative that emerged in Irish media in 2008 that has since gained considerable momentum concerns the idea of 'feeding the world', he states. This, they say, is inscribed with a counter narrative of salvation that adapts the language of sustainability for Irish agriculture. As discussed in the previous section, this particular narrative argues the 'special case' of Irish agriculture with its supposedly more sustainable grass-fed beef being part of the solution to world hunger and sustainability rather than part of the climate change problem. Byrne, Mullally and Sage (Byrne, Mullally, & Sage, 2017, p. 12) state that "this narrative is heavy with both the transcendent collective metaphor in 'feed the world' (somnia) and the resistance to change that would lower agricultural emissions (soma)". A third narrative of 'back to reality' is concentrated around political failure and the politicisation of science, they believe. This is a response to the inertia and obstacles of failed summits and government reluctance to tackle the problem of climate change. It discusses 'why can't we change', resorting to what the authors describe as "desperate rationalisation, authorization and moral evaluation strategies", including "explaining failure, drawing on the words of science reports and admonishing the inaction of wealthy countries".

In the remaining two narratives, the authors identify attempts to delegitimise action on climate change and an inability or lack of desire to wake up to the problem. The former features 'an appeal to realism, but couched in a critique of climate science and politics as an article of faith rather than rationality'. In this narrative 'climategate'

makes an appearance and belief in climate change is likened to a religion.

Somnambulism is most apparent in the final narrative that speaks of 'heads buried in the sand', and the 'need to wake up', and how events such as climategate provide people convenient excuses for not facing the problem.

Byrne, Mullally and Sage (Byrne, Mullally, & Sage, 2017) suggest that the language of narrative, myth and metaphor have long since been adapted to a broad range of social scientific disciplines and the humanities, as well as the interdisciplinary fields of cultural and media studies as a means of accessing the cultures, contexts and complexities of what we might generically label environmental discourse.

Leach, Scoones and Stirling (Leach, Scoones, & Stirling, 2010, p. 42) say that 'stories about climate change 'must become recognised as a contested, discursive recourse, a boundary object that facilitates argument about the diverse pathways to different futures.'

Byrne, Mullally and Sage focus on the process through which a social group adapts or readapts a common narrative so that it can lend a significance to their experiences and conditions. The focus, therefore, is not on looking for their meaning, whether they correspond to a particular reality or not, but on their workings, how they are narrated and what they achieve (Byrne, Mullally, & Sage, 2017, p. 85).

Despite the fact that the principal protagonists in the climate change debate are politicians, scientists and media commentators, and that religious leaders play a relatively minor role, the use of religious metaphors on all sides of the argument are striking, Byrne, Mullally and Sage state (Byrne, Mullally, & Sage, 2017, p. 100). This ties with the previous section on concepts of spirituality and connectedness in the last section on sustainability. The next section will examine another important facet of environmental communication, that is, framing.

3.1.6 Framing and Climate Change Communication in Ireland

Boykoff and Roberts (Boykoff & Roberts, 2007, p. 9) explain that framing is a process and an inherent part of cognition whereby content is constructed – in the form of issues, events and information – to order, organise and regulate everyday life. Framing permeates all facets of interactions between science, policy, media and the public. The process of media framing involves an inevitable series of choices to

cover certain events. These events are then converted into news stories. In recent years, more researchers from fields of environmental sociology, geography, political science and communications have examined framing of various scientific issues.

McDonald (McDonald, 2009, p. 47) reviews 30 years of literature on media effects and public opinion to the issue of climate change and examines the key role of framing in the media. A key understanding from the framing literature, she says, is to consider individual and group internal schema (sometimes called frames in thought), before constructing external frames in communication. Effective framing of an issue such as environmental sustainability may increase attention by presenting information in an accessible, relevant way for the audience, she believes. Inappropriate or irrelevant framing can lead the audience, to reject or ignore otherwise useful information, she states.

Mainstream Irish media largely present what Hulme (Hulme, 2009) refers to as a reformist approach to climate change. This position deals with climate change within the prevailing institutional and economic system, as opposed to advocating a 'radical transformation', which promotes large-scale changes as a consequence of conceiving of climate change as a product of that system and placing it in a wider sustainability debate.

Climate change communication research in Ireland has only recently emerged as a distinct field of inquiry. Fox and Rau (Fox & Rau, 2016, p. 1) state that research to date reveals the marginalisation of climate change in the main stream media, which is further amplified by its segregation from closely related topics of major public concern in Ireland such as extreme weather events, flooding, energy resources, or economic recovery.

Most of the research focuses on print media coverage of climate change topics, drawing mostly on quantitative data generated through multi-layered keyword searches. This is frequently complemented by some form of narrative analysis to identify dominant discourses, as we have seen in the last section.

According to Fox and Rau (Fox & Rau, 2016) media coverage in Ireland more generally, and environmental and climate change material in particular, frequently remain focused on local and national issues. For example, they say, coverage of the 2009 and 2014 flood events frequently focused on local impacts and concerns, with

limited attention being given to global causes of flooding such as climate change, increases in extreme weather events, and rising sea levels. Also, the authors state that citizen involvement in the production and dissemination of news remains limited in the context of conventional media.

According to Wagner and Payne (Wagner & Payne, 2017) broadsheet newspapers primarily frame climate change as an economic or policymaking challenge, drawing on the mostly optimistic discourse of ecological modernisation. They view this dominant discourse as one which recognises the structural nature of climate change but believes that existing social, political and economic institutions are capable of internalising the requisite response to it. This perspective rests upon the idea that businesses can and will respond to environmental policies, spurring technological innovation and economic efficiency and improving both the environment and the economy as a result. This would appear to follow the BAUU as discussed in the last chapter.

Mainstream media reporting in Ireland (and other countries) is also heavily segmented. Broadsheets often come sectioned into national, world, business, sport or lifestyle. This also coincides with a tendency to favour national and international stories at the expense of the local. Such artificial distinctions might support why climate change is so often located in the 'world' sections thus contributing to framing and isolating them as such. RTE's most successful sustainability venture Eco Eye, while gaining a large audience share, remains a niche environmental programme separated from their more popular current affairs programmes.

The role of voices and organisation's in the shaping of media coverage is also suggestive of internal hierarchies with regard to the legitimacy of go-to experts, news data sources, and issue-stakeholders, Fox and Rau believe (Fox & Rau, 2016, p. 19). Moreover, they say, their presence in news stories is indicative of broader societal hierarchies, as these are the personages and agencies powerful enough to gain media access and help construct important issues. Wagner and Payne (Wagner & Payne, 2017) examined which interest groups dominated and shaped discussion by linking organisations to clusters of normative statements about climate change. In their sample of 517 articles, they identified 250 normative statements

made by 135 organisations, thereby revealing the large role of interest groups in framing the response.

McNally (McNally, 2018) also identifies politicians as the main voices in 71 articles drawn from her overall sample (n=347). Added to them are the voices of elite business, civil society and environmental groups are the least quoted. This confirms the marginalisation of particular themes and, arguably, according to McNally (2015), limits the potential for the public to expand their carbon literacy and engage with efforts towards a low-carbon transition.

Despite significant advancements in research over the past 3 to 5 years, serious limitations remain regarding the focus and methodology of environmental communication studies, for example, there are currently no data available on social media and other online sources. Similarly, the exclusion of tabloids, university and special interest papers (e.g., the Farmers Journal), local newspapers and freesheets from climate change communication research to date results in a large part of the Irish media landscape remaining underexplored, Fox and Rau state (Fox & Rau, 2016, p. 21).

Fox and Rau argue that existing inquiries into climate change debates in Ireland reveal the narrowness of media portrayals which they believe severely limits opportunities for the general public to engage with this important issue (Fox & Rau, 2016, p. 23). For McNally (McNally, 2018) this narrowness is a key obstacle to developing public literacy on transitioning to a low-carbon society and to facilitating engagement by promoting informed judgement and decision-making on the range of activities involved, which are not only economic and technical but also social. Fox and Rau (Fox & Rau, 2016) conclude that there is a democratic need to openly deliberate on vital alternatives, expand the use of less alienating local and justice based discourses, and enable public discussion of the country's morals and values regarding climate change. This thesis will look at digital storytelling as one method that could be possibly used to do this.

Although, research into climate change communication in Ireland has only recently emerged as a new field of inquiry, work carried out to date has revealed a number of key trends, one of which is a dominant narrow framing of the issue. This allows for little room for discussing the participation of the public, radical alternatives and local

contexts, McDonald says (McDonald, 2009, p. 21). Also, there is almost no discussion on the role of culture and socio-cultural conditions of the everyday in addressing the challenges of climate change, an omission that is mirrored in many environmental debates.

3.1.7 Summary of Section A: Communication Approaches & Change

In summary, then, many studies have shown that for communication to be effective in terms of promoting active engagement, providing more or better information is not enough.

On the whole, there is no direct correlation between communication and behaviour change. There is no one-size fits all solution. What is needed is a mix of measures of which communication is only one, and it will only work when it is embedded in other approaches which are more directly linked to practical behaviour and practices in social life. Communication also has to use a mixture of modes and strategies, from verbal to visual, from the spoken word to the digital message. Communicators can only be sure that their messages will be understood if they understand their audiences, their values, fears, hopes and the situation of communication.

How climate change is communicated invites us to consider important questions about how societies work and the kinds of relationship which exist between the various actors in these complex systems. Knowledge and action emerge from ideas, practices, discourses and perceived risks as much as from technical assessments or environmental quality.

The review of the environmental communication literature reveals a growing field influenced by numerous disciplines. When considering environmental communication, authors more or less agree to dismissing the information deficit model of science communication in favour of public engagement processes that carry more dialogue-oriented approaches to communication.

Applying the basic elements of communication planning – sender, message, media, audience and effect – to the communication of sustainability immediately introduces challenges of a conceptual nature. Who is the sender of the communication? What is the overall strategy – and who gets to decide this strategy? What is the ‘solution’ to the problem? Who is the audience(s)? And what is the message? The short

answer to these questions is that environmental communication simply does not fit into a traditional planning framework. It is, therefore, relevant to examine communication from others angles, such as that of digital storytelling.

In conclusion, this literature review has highlighted the following points as important to this study: -

- Information deficit models are no longer considered to work for engagement and behavioural change.
- Audiences are not a blank canvas – sender and receiver (of messages) are equally active in the communications process
- Senders and receivers of communication messages are now considered as co-authors and co-creators of meaning
- Communication has moved from one-way communication to perspectives of dialogue and interaction
- Visual and emotionally engaging material enhances learning and recall
- Science communication has developed to focus on ‘science and society’ which highlights public participation and engagement
- Communication technologies can be used as facilitating tools for engagement
- There is a lack of research on the construction of environmental communication in ‘new’ media
- Social groups adapt or re-adapt common narratives, symbols, signs and metaphors in understanding environmental communications
- How environmental communication is framed is extremely important
- There is healthy debate in the area of behaviours and practices

All of these points raise extremely interesting questions in terms of communicating and engaging with people towards the changing of behaviour and practices and this has set the scene for the primary research of my thesis where farmers are shown the digital stories made by other farmers and their responses to same are captured.

The next section will now turn to discuss the area of social and psychological constructs, what they are and why they were chosen for this study.

3.2 Section B: Social and Psychological Constructs

To investigate whether the sample of ten farmers who created the digital stories, were significantly different to other dairy farmers, in the same region, adopting very similar farming practices, I conducted a survey of an additional 193 dairy farmers across the four West Cork dairy cooperatives, using a questionnaire approach. To do this, my questions were founded from a range of social and psychological constructs and the following sections provide a detailed discussion on same which is further elaborated upon in the methodology chapter.

3.2.1 Meaning of Constructs

A construct is a tool used to facilitate the understanding of human behaviour.

Behavioural sciences use constructs to label a domain of behaviour and it derives its name from the fact that it is a mental construction i.e., it is observed from natural phenomena and the common features of the observations are constructed as a label for the commonality or the underlying cause. A construct derives its scientific value from the shared meaning it represents for different people. I decided to select both psychological and social constructs for my study.

3.2.2 What are Psychological and Social Constructs?

Psychological constructs cannot be observed directly. One reason is that they represent tendencies to think, feel, or act in certain ways. For example, to say that a particular University student is highly extraverted does not necessarily mean that she is behaving in an extraverted way right now. In fact, she might be sitting quietly by herself, reading a book. Instead, it means that she has a general tendency to behave in extraverted ways (talking, laughing etc.) across a variety of situations. Another reason psychological constructs cannot be observed directly is that they often involve internal processes. Fear, for example, involves the activation of certain central and peripheral nervous system structures, along with certain kinds of thoughts, feelings and behaviours – none of which is obvious to an outside observer. Notice also that neither extraversion nor fear ‘reduces to’ any particular thought, feeling, act or physiological structure or process. Instead, each is a kind of summary of a complex set of behaviours and internal processes.” (Understanding Psychological Measurement, p. 2)

Social constructionism is a theory that examines the development of jointly-constructed understandings of the world that form the basis for shared assumptions about reality. Different to psychological constructs, the theory centres on the notion that meanings are developed in co-ordination with others rather than separately within each individual. An example of a social construction is the concept of self/self-identity – how people in society construct ideas or concepts that may not exist without the existence of people or language to validate those concepts. Strong social constructs rely on the human perspective and knowledge that does not just exist, but is rather constructed by society. A social construct or construction concerns the meaning, notion, or connotation placed on an object or event by a society and adopted by the inhabitants of that society with respect to how they view or deal with the object or event. In that respect, a social construct as an idea would be widely accepted as natural by the society.

Constructionism became prominent in the USA with Peter L. Berger and Thomas Luckmann's book, *The Social Construction of Reality* (Berger & Luckmann, 1966). Berger and Luckmann argue that all knowledge, including the most basic, taken for granted common sense knowledge of everyday reality, is derived from and maintained by social interactions. When people interact, they do so with the understanding that their respective perceptions of reality are related, and as they act upon this understanding their common knowledge of reality becomes reinforced. Since this common sense knowledge is negotiated by people, human typifications, significations and institutions come to be presented as part of an objective reality, particularly for future generations who were not involved in the original process of negotiation (Berger & Luckmann, 1966).

Similarly, Galbrin states that social constructionism may be defined as a perspective which believes that a great deal of human life exists as it does due to social and interpersonal influences (Galbin, 2014, p. 82). Social constructionism concentrates on investigating social influences on communal and individual life. The subjects that social constructionism is interested in are those to do with what anthropologists call culture and sociologists call society: the shared social aspects of all that is psychological (Galbin, 2014, p. 83). It places an emphasis on the complexity and interrelatedness of the many facets of individuals within their communities

An integration of the existing literature on social constructionism shows that there are several cardinal principles emphasised in social constructionism. These include: realities are socially constructed; realities are constituted through language; knowledge is sustained by social processes; and reflexivity in human beings is emphasised (Galbin, 2014, p. 84).

But what does this mean and what is its point? The core idea seems clear enough, according to Galbin. It means that the reality we experience would not have existed if we had not built it that way and in fact, we need not have built that particular reality in its' current form at all. If we had been a different type of society and had different values and interests, we might have built something different.

Similarly, Berger and Luckmann's (Berger & Luckmann, 1966) account shows how the world can be socially constructed by the social practices of people, but at the same time be experienced by them as if the nature of their world is pre-given and fixed.

3.2.3 The Selection of Social and Psychological Constructs

From the previous sections, we can see that social and psychological constructs can provide us with the tools to better understand human behaviour. Particularly, Stoll-Kleeman, O'Riordan and Jaeger (Stoll-Kleemann, O'Riordan, & Jaeger, 2001) claim that socio-psychological approaches are needed to explain the reasons behind environmental actions. I selected to assess both social and psychological constructs in relation to the environment, as the foundation for my questionnaire.

I examined the literature and selected the constructs contained in the Theory of Planned Behaviour as suitable to my study objectives. In so doing, my intention was not to implement the Theory of Planned Behaviour itself, but to draw on the constructs contained therein in order to develop my questionnaire. Of course, operationalising the Theory of Planned Behaviour to a study of Irish farmers would be a useful future study but this was not my objective, it was merely to draw on the construct headings and develop my questions from this foundation. These questions are elaborated upon in the following pages. But first, I will provide some background information on the

Theory of Planned Behaviour itself so that the reader can understand the principles of the theory itself and its development.

3.2.4 The Theory of Planned Behaviour Constructs

The Theory of Planned Behaviour (TPB) (Ajzen & Fishbein, 2000) is guided by three variables namely *attitude*, *subjective norm* and *perceived behavioural control* (PBC). Attitudes are an individual's positive or negative evaluation of performing a behaviour. Subjective norms are an individual's beliefs about what significant others think she/he should do. PBC reflects perceptions of the ease or difficulty to perform the behaviour.

The theory indicates that given sufficient actual behavioural control (ABC), like capital, knowledge, skills, opportunities, people will carry out their intention. Consequently, if they perceive they have enough ABC they will perform the behaviour. Ajzen and Fishbein's (Ajzen & Fishbein, 2000) argue that attitudes are most likely to predict behaviour when the level of specificity of the attitude matches that of the behaviour, when a person perceives that social norms to support the behaviour and when the person thinks he or she is able to do the appropriate behaviour.

Adjustments to the theory incorporates the actor's perceived control over the outcome of his/her behaviour. The underlying assumption is that humans are rational and make systematic use of available information. Note that this theory looks at intentions rather than actual behaviour. The theory describes the relationship between attitudes – intentions – behaviour of an actor, and assumes that changes in awareness and intention lead to action. The 'intentions to behave' are explained from attitudes, social norms and perceived control.

The TPB suggests that the likelihood of a particular behaviour can be predicted by the individual's intention to perform that behaviour, capturing the motivational factors that influence behaviour. According to the TPB, behaviour is guided by the favourable or unfavourable evaluation of the behaviour (attitude towards the behaviour), perceived social pressure (subjective norms, SN) and perceived ability to perform the behaviour (perceived behavioural control, PBC). In general, the more

favourable the attitude and subjective norm, and the greater the perceived control, the stronger the intention to perform a given behaviour should be (Ajzen & Fishbein, 2000).

The main assumption of the theory is that behavioural intentions of an individual are directly related to his/her attitude and that people behave rationally in accordance with the beliefs they hold and that the person's behaviour is a function of the information or beliefs he/she has (these may be based on experience or facts).

The TPB has had extensive use in a large range of studies but the concept of behavioural change as a linear process has been heavily contested in recent studies such as Elizabeth Shove's *Beyond the ABC*. My intention here, as stated, was merely to use the social and psychological constructs for a comparative analysis. In summary then, I concentrated on developing questions in relation to the following social and psychological constructs:

1. Future Intention
2. Past Behaviour
3. Motivation
4. Attitudes
5. Identity
6. Efficacy
7. Norms
9. Control

3.2.5 Aspects of Social and Psychological Constructs

Questions in relation to the following constructs were included in my study.

Intention

Intention is the precursor of voluntary behaviour. According to the original theory TRA (Theory of Reasoned Action), the intention to adopt a particular behaviour is a

function of attitudes towards the behaviour and the subjective norm – the extent to which one is influenced by the views of other people regarding the behaviour.

Past Behaviour

Fielding, McDonald and Louis (Fielding, McDonald, & Louis, 2008) argue that past efforts in ecological management practices, comprising a set of behaviours that require substantial outlay of time and capital, are likely to have a substantial impact on future intentions.

Motivation

Motivations' reflect the reasons why a person follows their aims and desires and are the primary driving force for doing something such as joining an agri-environment scheme. The orientation of motivation concerns the underlying values, attitudes and goals that give rise to action. There is a distinction between intrinsic motivation, which refers to doing something because it is inherently interesting or enjoyable, and extrinsic motivation, which refers to doing something in response to external pressures, or rewards. Attitude is a significant intrinsic motivational determinant, but not the only one.

Intrinsic motivation (IM) has been defined as (a) participation in an activity purely out of curiosity, that is, for a need to know about something; (b) the desire to engage in an activity purely for the sake of participating in and completing a task; and (c) the desire to contribute (Dev, 1997).

Extrinsic motivation (EM) refers to motives that are outside of and separate from the behaviours they cause; the motive for the behaviour is not inherent in or essential to the behaviour itself (Hoyenga & Hoyenga, 1983). An example of IM is the individual that goes to class because he or she finds it interesting and satisfying to learn about certain subjects. Deci and Ryan (Deci & Ryan, 1985) posit that IM stems from the innate psychological needs of competence and self-determination. Thus activities that allow individuals to experience such feelings will be engaged in again freely out of IM.

Contrary to IM, extrinsic motivation (EM) pertains to a wide variety of behaviours which are engaged in as a means to an end and not for their own sake (Deci & Ryan, 1985). In addition to intrinsic and extrinsic motivation, Deci and Ryan have recently suggested a third type of motivational construct is important to consider in order to fully understand human behaviours. This concept is termed amotivation. Individuals are amotivated when they do not perceive contingencies between outcomes and their own actions. They are neither intrinsically nor extrinsically motivated.

One approach is to ask people to rate their motivation (i.e., “how motivated are you?”). However, such an approach is limited to people’s conscious understanding of their own psychological states and can further be biased by social desirability concerns; hence, research has developed a variety of cognitive and behavioural paradigms to assess motivation without relying on self-reports.

The notion of intrinsic motivation is closely related to intrinsic value. Intrinsic motivation refers to motivation that is animated by personal enjoyment, interest, or pleasure, and is usually contrasted with extrinsic motivation, which is manipulated by reinforcement contingencies (Guay, Ratelle, Roy, & Litalien, 2010). Typically, manipulation of extrinsic motivation is effected by the provision of rewards, which can be either tangible (e.g., money, grades, privileges, etc.) or intangible (e.g., praise). However, extrinsic motivation can come about by other means. For example, self-determination theory distinguishes several different types of regulatory mechanisms that can act as reinforcement. External regulation corresponds to the lowest level of self-determination, where behaviour is motivated by a desire for reward or punishment avoidance. Introjected regulation occurs when behaviour is driven by internal pressures such as obligation or guilt. Under identified regulation, individuals identify with or find personally important the reasons for performing an activity. Finally, under integrated regulation, the regulator is actually consistent with an individual’s other values and needs and becomes part of one’s self-identity. This latter type of regulation is the closest to intrinsic motivation. Educators typically consider intrinsic motivation to be more desirable than extrinsic motivation, and some research suggests that the learning outcomes of intrinsic motivation are better than those obtained under extrinsic.

Motivational patterns, in addition to ability, may influence the way people learn: whether they seek or avoid challenges, persist or withdraw upon difficulties, or whether they use and develop their skills effectively. Different motivational patterns relate to different aspects of the learning process, e.g., achievement goals (performance or mastery), time spent on tasks, performance.

Those who demonstrate extrinsic motivations respond to rewards. In the context of the environment these can be direct rewards, in the form of payments to the farm business, either for investment or to enhance income, or indirect rewards through recognition from their peers and from society. Motivation is an important factor and to test motivation, a number of statements were included in the questionnaire designed to test the farmers' motivations. These findings and their importance is discussed in more detail in Chapter 6.

Attitudes

'Attitudes' may be thought of as favourable or unfavourable dispositions and can be measured in abstract and qualitative terms. Hogg & Vaughan (Vaughan & Hogg, 2005) define an attitude as "a relatively enduring organisation of beliefs, feelings, and behavioural tendencies towards socially significant objects, groups, events or symbols" (p. 150). In considering the significance of attitudes, characterised in this way, to environmental management, it is important to keep in mind that firstly, attitudes are formed or constructed, and the factors that influence the formation or construction of attitudes are of as much interest to social scientists as the attitudes themselves. In other words, the adoption of attitudes is a process. Secondly, while the focus here is on environmental sustainability, farmers will hold attitudes across a wide range of issues. Thus, a farmer's attitude to environmental management will sit alongside his or her attitude to the needs and priorities of the farm business and farming in general.

This brings us to the third point, which is that attitudes do not necessarily translate into behaviour. 'Attitude-behaviour inconsistency' or the 'value-action gap' (Barr & Gilg, 2016) has been widely observed in studies of environmental behaviour, such as recycling, in the general populace.

Values and beliefs can inform and influence motives and attitudes. Values' refer to ideals and desired outcomes to be striven for and tend to be stable over time and, like 'norms', they are socially and culturally conditioned. They are cognitive constructs that explain an individual's preferences in life goals, principles, and behavioural priorities (Rokeach, 1973). 'Beliefs' are essentially convictions; they tend to originate from values but are not necessarily always based on reflection and conscious objective thinking. Rokeach (Rokeach, 1973) suggests that 'attitudes' are subsystems of beliefs and values with the entire set of attitudes a person holds constituting a 'belief system'. Thus to understand attitudes it is necessary to understand beliefs and values. Attitudes are thought to be susceptible to transient influences and changing contexts than values and are therefore not entirely permanent nor static and are recreated each time an individual responded to a question, a behaviour or a specific occurrence.

Ahnstrom et al. (Ahnström, et al., 2009) define attitudes as a readiness to act or a mind-set that is used by an actor to act and judge in situations of decision making. For many academics, the conceptualisation of attitudes is problematic, some take an individualistic approach and regard farmers' attitudes as influenced by psychological characteristics while others emphasise the cultural and social construction of meaning and socialisation. For example, for Siebert, Toogood and Knierim (Siebert, Toogood, & Knierim, 2006) 'attitude' is understood to be a combination of subjectively perceived factors that influence the farmer such as interests, values, norms, problem awareness and self-perception – as these collectively can explain willingness to undertake environmental activities.

Others (Woerkum, 2000) similarly argue that the concept of attitude assumes a relatively constant and sustainable inclination to react in the same way to an 'object' but in reality people often show different attitudes depending on the context and their concept or definition of the 'object'. It has been argued that attitudes cannot be studied as only personal parameters as they depend on the context, and especially social factors. As such the attitudes of the farmer are thought to be dependent on the norms that exist in the group/s that the farmer identifies with. For example, Ahnstrom et al (Ahnström, et al., 2009) found from a literature review that it

seems to be a part of the farmers' norm (or social identity) to claim to be a steward of the land who cares for nature.

These social norms are standards of behaviour based on shared beliefs about how individuals should act and are constituted when members in a group, such as farmers, have expectations of how other members in the group think, believe, know and act. Farmers not only have a social identity (in line with social norms—what social group the actor identifies with and thus what norms should be followed), they have their own unique personal value system and worldview based on their own experiences and moral values. Thus a farmer has his own view on what is 'good farming', his own set of convictions and opinions that function as an internal frame of reference and this determines his perception of external factors and his own preferences (Schoon & Grotenhuis, 2000). To gauge attitude a number of questions were included in the questionnaire, these are discussed in the methodology chapter.

Identity

Self-identity and social identity are related constructs but they are not the same. While social identity (from the social identity theory) defines the self mostly in terms of membership of social groups and categories, self-identity (from self-identity theory) describes the self in terms of various social roles someone occupies.

When someone sees himself/herself as part of a group, the norms inside the group will shape and guide attitude-related behaviour and when this is not the case, personal beliefs/identities will determine behaviour (Smith & Louis, 2009). Although people can belong to several groups, the ones which are more salient (the one with which the person identifies the most to the respondent will have the strongest influence on behaviour (Tajfel & Turner, 1979). This also means that groups that individuals belong to (i.e., in-groups) will have more influence than groups that individuals do not belong to (i.e., out-group) (Smith & Louis, 2009). To explore the significance of identity, the questionnaire includes a number of identity related questions, which are discussed in the methodology chapter.

Efficacy

Bandura (Bandura, 1982) defines perceived self-efficacy as “judgments of how well one can execute courses of action required to deal with prospective situations”. Eccles and Wigfield (Eccles & Wigfield, 2002, p. 10) elaborate on Bandura’s description, defining self-efficacy as an individual’s confidence in his or her “ability to organise and execute a given course of action to solve a problem or accomplish a task”. According to Bandura’s (Bandura, 1982) self-efficacy theory, efficacy is the major determinant of effort, persistence, and goal setting. Empirical research supports this notion, suggesting that individuals with higher self-efficacy tend to be more motivated and successful on a given task (Pintrich & EV De Groot, 1990). Self-efficacy has also been associated with the use of cognitive strategies, and self-efficacy perceptions predict achievement over and above actual ability levels (Pintrich & EV De Groot, 1990).

In outlining principles for behaviour change Bandura (Bandura, 1982) emphasises self-efficacy which is derived from a) performance accomplishments (mastery), b) vicarious experience (feelings based on the experience of someone else), c) verbal persuasion, and d) physiological states. There is evidence that the higher level of perceived efficacy, the more farmers are likely to persist with the new behaviour and because of this, questions in relation to efficacy are included in this study.

Norms

Standing within the community and respect amongst peers, as well as recognition in a wider society can motivate farmers to farm in a more environmentally friendly manner and participate in schemes (Lundie, Dwyer, & Forsyth, 2007). This relates to the construct about the influence of social norms.

However, the literature emphasises that group norms reflect two components: what people should do (injunctive norms) and what people actually do (descriptive norms) and that both can independently influence behaviour.

Smith and Louis (Smith & Louis, 2009) conducted two experiments and found that descriptive and injunctive group norms did interact to influence group members’

attitudes, behavioural willingness and behaviour. Besides injunctive and descriptive norms, the literature mentions as well personal /moral norms as relevant for the attitude-behaviour relationship. Thøgersen (Thøgersen, 2006) included a taxonomy of norms and found that descriptive norms were more strongly correlated with subjective social norms than with personal/moral norms when analysing four types of environmentally responsible behaviours. The reason could be that descriptive and social norms are exposed to externalisation, while personal/moral norms to internalisation.

Moral/personal norms will influence behaviour when they are activated. Activation occurs when (a) someone is aware of the consequences of one's behaviour for the welfare of others, and (b) one ascribes at least some responsibility for these consequences to oneself (Harland, Staats, & Wilke, 2006).

Control

Another line of inquiry in the field of motivation explores the issue of locus of control. According to this theory, individuals should be more motivated to the extent that they feel they are in control of their own successes and failures (Eccles & Wigfield, 2002). Farmers are asked questions in relation to control and this is included in included in the next chapter.

3.2.6 Summary of Section B: Social and Psychological Constructs

Social and psychological constructs can help us to understand why we do what we do and act the way we act. This study uses a number of constructs to build a profile of the research participants for comparative purposes. The Methodology Chapter (chapter 4) provides detail on how these constructs have been used in terms of questions created under each construct with chapter 6 providing the results giving a profile and analysis of the farmers, based on the results of the questionnaire.

3.3 Chapter Summary

The first part of the literature review has examined communication approaches in terms of promoting engagement with pro-environmental behaviours and practices and how digital storytelling may fit within this field. The second part of the chapter

has given an overview of the social and psychological constructs selected for this study upon which the next chapter on the methodology will elaborate.

CHAPTER 4 METHODOLOGY



Image: Digital Storytelling Workshop with Farmers in West Cork. Source: Mediamakers.ie

4.0 Introduction

This study addresses the meaning of sustainability to a group of dairy farmers in the West Cork region through the creation of digital stories and examines the impact on other neighbouring farmers when viewing the stories.

The overarching questions are as follows and these are investigated using a mixed methodological approach:

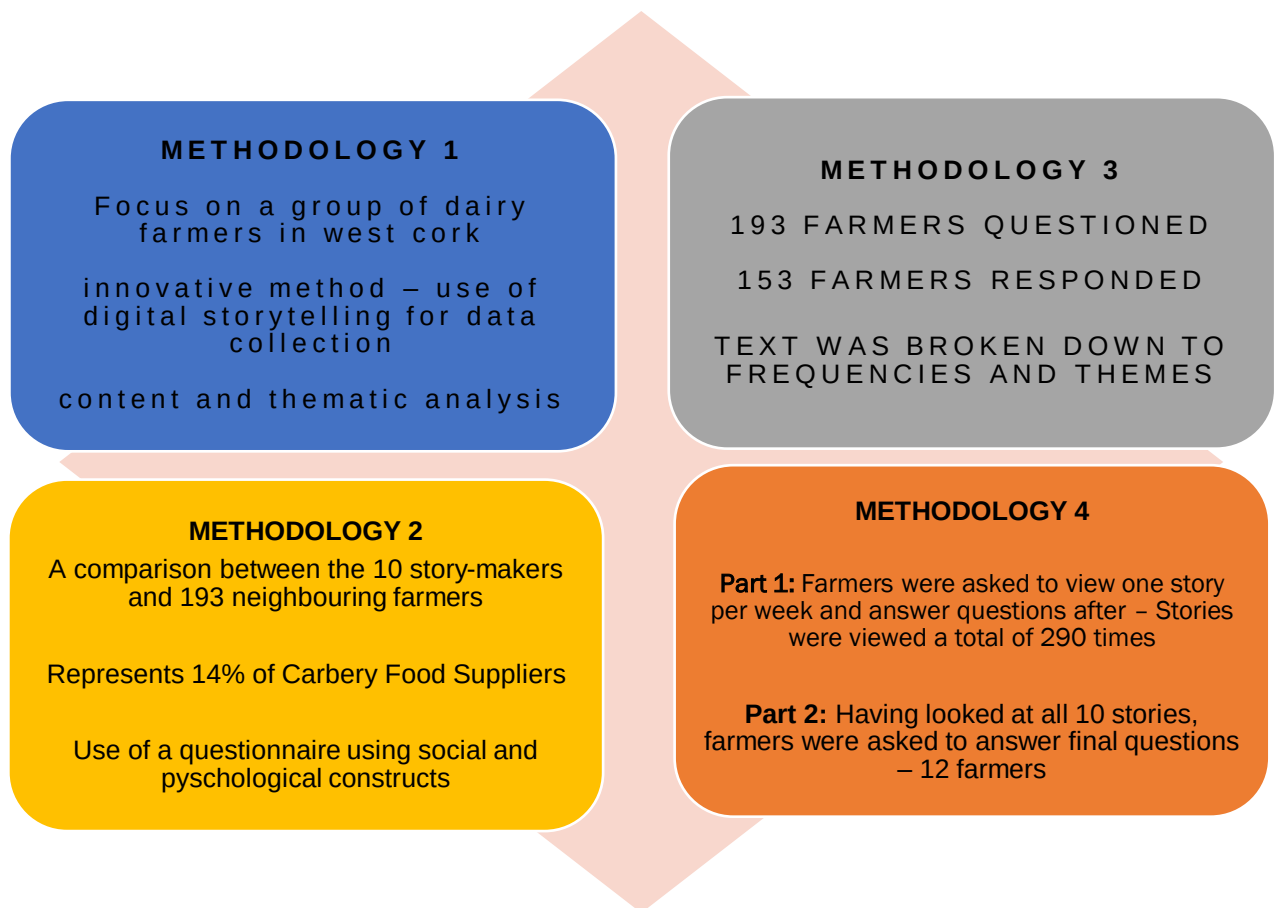
1. What does 'sustainability' mean to farmers?
2. How does this relate to a wider group?

3. What needs to happen for farmers to adopt environmental good practices?
4. Is digital storytelling a useful means to communicate with farmers?

There are four findings chapters as follows and this methodology chapter provides a detailed account of how the data was collected for each of these findings chapters and the manner in which the data was analysed:-

1. Story Makers: This chapter examines what the digital stories of 10 farmers say, in answer to the question of 'what does sustainability mean to you, on your farm?'
2. Story Makers and Neighbouring Farmers Comparison: This chapter profiles the story-makers compared to the neighbouring farmers in terms of psycho-sociological constructs and asks if the results of the digital stories can be inferred to a wider group of farmers.
3. Neighbouring Farmers Views: This chapter analyses what neighbouring farmers say when asked 'what needs to happen for farmers' to adopt environmental friendly practices'?
4. Story Watchers: This chapter contains the feedback from the story watchers (those farmers who viewed their neighbours digital stories).

The different methods are summarised in the following graphic.



4.1 The Story

Storytelling, narratives and digital storytelling are key components of this study, it is thus important to explore their significance and how they inform the primary research. Even though the digital component of the storytelling may be a recent development, the study of language and learning within a cultural, social or experiential context is not a new area of research.

But where does the story of narrative sociology start? Berger and Quinney (Berger & Quinney, 2004) state that narrative scholars seem to concur with the proposition that lived experience can be understood through the stories people tell about it. But as Hyvärinen (Hyvärinen, 2016) outlines, before the narrative turn in literature during the 1960's, and before the time of narratology, there was no narrative sociology or narrative discipline. He goes on to elaborate that before the 1960's, literary theorists studied novels, folk tales, and autobiographies; sociologists studied diaries and biographies. The possibility of theorising and analysing all of them and many other texts together was missing during the pre-history of narrative sociology. He points to the importance of the 'narrative turn' which can be seen by the growth in

popular as well as scholarly interest in lives and stories and the widespread academic engagement over the last few decades with the broad developments and issues covered by the term (Hyvärinen, 2016).

Berger and Quinney (Berger & Quinney, 2004) say that the groundwork for the qualitative inquiry and the ethnographic fieldwork method was laid down by early anthropologists and Chicago school sociologists in the early twentieth century. The 1980s witnessed such prominent narrative philosophers as Alasdair MacIntyre and Paul Ricoeur and psychologists such as Donald Polkinghorne and Jerome Bruner.

The wave of theorising about narrative that swept the social sciences in the 1980s was inspired by the concept that, because people lived their lives in tune with the stories they told, analysing those stories would provide a better explanation for their behaviour than structuralist explanations. For sociologists, as for many other scholars, narrative was seen as capable of subverting the conventions of social structure and normal science.

Between 1970 and 1990, 587 articles on narrative or storytelling were published in the journals indexed by Sociological Abstracts. In the next 20 years, 10 times that many were published. Interest in narrative has extended into fields as diverse as law, urban planning, cognitive science, anthropology, and organizational behaviour (Polletta, Chen, Gharrity Gardner, & Motes, 2011).

This long tradition of storytelling and narrative methods in the arts and in the social sciences has fostered a number of research centres who are dedicated to this area. The George Ewart Evans Storytelling Centre in Glamorgan (GEECS) at the University of South Wales, is an example of a UK academic research centre, launched in 2015, devoted to the study of storytelling and its applications. Furthermore, the International Research Centre for Interactive Storytelling (IRIS) promotes and supports creative research into the use and application of storytelling in media and technology. It was formed to explore new, alternative and emerging methods of storytelling in an interdisciplinary and multi-perspectival context. Here in Ireland, based in Maynooth University, there is the Centre for Transformative Narrative Enquiry at Maynooth University which focuses on the role of narrative enquiry. Another example is the Centre for Narrative Research (CNR) at the University of London. The Centre aims to generate and develop innovative narrative

research of all kinds, and to bring narrative researchers from all over the world into productive dialogue.

There is also a Federation for European Storytelling which is a global network of organisations and associations active in the field of storytelling. The network aims to empower storytelling in Europe through sharing, learning and relationship building.

The following paragraphs focus on the story, storytelling and narratives with the piece after this, providing more information on the digital element of 'digital storytelling'. It is useful to start here, as stories and narratives have long been in usage but the digital element has added new ways of using the media and later sections will give examples of this.

A story describes a sequence of actions and experiences done or undergone by a certain number of people, whether real or imaginary. These people are presented either in situations that change or as reacting to such change. In turn, these changes reveal hidden aspects of the situation and the people involved, and engender a new predicament which calls for thought, action or both. This response to the new situation leads the story toward its conclusion.

Feldman et. Al. (Feldman, Skoldberg, Brown, & Horner, 2004) discuss how stories can be distinguished by their distinct arc from beginning to end; that is, the story takes us from one specific place to another. The events in the story must disrupt an initial state of equilibrium that sets in motion an inversion of a situation, a change of fortunes – from good to bad, from bad to good, or no such reversal of polarity, just an 'after' different from the 'before' but neither necessarily better or worse. In this way, stories are interpretations of actions that have occurred in a particular sequence. Stories provide rich data that express movement, interpret ideas, and describe from the storyteller's perspective how things used to be and how they are, as well as how they should be (Feldman, Skoldberg, Brown, & Horner, 2004)

Lisa Cyr (Cyr, 2015) believes that every person has stories to tell and it is in the telling that we discover how much of our experiences and learning we have in common with others. In particular, we listen to the answer to three questions: 'what makes it your version of the story? How does this story show who you are? And how does this story show why you are who you are? In this context, Lambert (Lambert, 2009) says that stories act as metaphors in order to enlighten what otherwise is hard

to articulate. Lambert (2009) goes on to say that these stories can weave together our individual experiences to reveal a picture of a community, a group, a vision or a shared value. Simmons (Simmons, 2002) points out that a story connects with people because human beings have a natural curiosity about each other, and when the data are coupled with a story, then the logic and description are more credible.

Storytelling is about showing, rather than telling. People discover knowledge for themselves rather than being told. Schwartz & Abbott (Schwartz & Abbott, 2007) say that storytelling is sharing. Someone teaches, someone learns; someone is vulnerable and exposing; someone is compassionate and validating. Storytelling illuminates the richness of these experiences by bringing these 'situations' to life and allows the listeners to reflect on and assimilate the story into the context of their own values, beliefs, knowledge and experiences (Greenhalgh, 2001). Stories told in casual conversation can harness another sort of information also; they provide insight into how storytellers construct reality, and to what they attach importance. Stories, then, allow listeners to assimilate the story into the context of their own values, beliefs, knowledge and experience. Telling a story is in itself an activity that requires a degree of critical awareness – knowing what to leave in and what to omit, selecting information and description that will substantiate the story, judging the audience, and presenting the piece in a way that the audience (whether one person or a group) will find compelling, interesting and engaging.

In the Handbook of Practical Programme Evaluation, Richard Krueger states that stories provide insights that can't be found through quantitative data. Evidence suggests that people have an easier time remembering a story than recalling numerical data. The story is "sticky" but numbers quickly fade, says Krueger (Krueger, 2015). He believes that a story helps us to understand motivation, values, emotions, interests and factors that influence behaviour. Stories can give us clues about why an event might occur or how something happens. Stories help us to interpret quantitative data. For example, a monitoring system might detect a change in outcomes, but what prompted the change usually can't be found in these data systems. Stories can help communicate evaluation findings.

Stories communicate emotions. Statistical and survey data tend to dwell on the cold hard facts. But stories are different and show us the challenges people face, how

people feel, and how they respond to situations. Researchers can be apprehensive about emotional messages for valid reasons. Emotional messages can ignore important facts, be fabrications or overlook empirical data. Krueger suggests to combine the emotional aspect of stories with empirical data to address the concerns of both the heart and the head (Krueger, 2015).

Jane Field (Field, 2004) outlines that when a person is listening to a story, both sides of the brain are working. The left side of the brain processes the words whilst the right side activity fills in the gaps. A good story, she says, uses 'visual, auditory, kinaesthetic and olfactory words' to give the story depth and to stimulate the right brain to enrich the meaning of the story and store it in the memory for 'easy recall'.

A story is often loosely defined as having a beginning, a middle and an end, with a protagonist (often human), an object, a practice or an idea, followed by a form of transformation or conflict. The term narrative and story are often used interchangeably. They have many of the same characteristics such as chronological order and thematic ordering of events (Feldman, Skoldberg, Brown, & Horner, 2004). Throughout the relevant literature, the term 'narrative' is often used interchangeably with 'story'. However, the events that comprise a certain story can be presented in many different ways forming different narratives, chronologically or not, but the story remains the same. Reshuffling the order of events changes the narrative, not the story (McCall, Shallcross, Wilson, Fuller, & Hayward, 2019).

Stories allow listeners to assimilate the story into the context of their own values, beliefs, knowledge and experience. The further advantage of stories, Joe Lambert says (Lambert, 2009), is that stories in many cases convince listeners, not because they are truthful, but because they are lifelike, coherent, believable and because they have verisimilitude.

Simon Hodges (Hodges, 2014) claims that today, storytelling is wildly popular. But why is that? The first reason he claims is obvious: climate change, inequality, violence and other challenges can't be solved by doing more of the same, he says. He believes that we need new narratives that connect with peoples' deepest motivations and promote more radical action. Stories engage people at every level, he states – not just in their minds but in their emotions, values and imaginations, which are the drivers of real change. So, he goes on to say that if we want to

transform society, we must learn to tell – and listen to – a new set of stories about the world we want to create.

Psychologists and neuroscientists have recently become fascinated by the human predilection for storytelling. Why does our brain seem to be so wired to enjoy stories? Siemens (Siemens, 2008) asks. And how do the emotional and cognitive effects of a narrative influence our beliefs and real-world decisions. The answer to these questions, Siemens says (Siemens, 2008)) seems to be rooted in our history as a social animal. He states that we tell stories about other people and for other people. And stories have a unique power to persuade and motivate, because they appeal to our emotions and capacity for empathy.

Storytelling is a highly nuanced means of communication, usually articulating cause-and-effect relationships between events over a period of time, and often in relation to a certain character. Storytelling potentially draws on commonalities between the story or the storyteller and the listener or the reader. This, combined with the underlying assumption of creditability in the teller's story or experience, can potentially motivate and persuade individuals towards behavioural change and reduces resistance to any action implied by the message.

4.2 Narratives

Feldman et. Al. (Feldman, Skoldberg, Brown, & Horner, 2004) state that narrative form can be loosely defined as a sequence of events, experiences or actions with a plot that ties together different parts into a meaningful whole. The information presented in the narrative is valuable in that through the events the narrative includes, excludes and emphasises and the storyteller not only illustrates his or her version of the action but also provides an interpretation or evaluative commentary on the subject. In addition, the sequencing of the narrative form is important because its structure reveals what is significant to people about various practices, ideas, place and symbols (Feldman, Skoldberg, Brown, & Horner, 2004).

The narrative approach to understanding cognition, personality development, culture, and community is one that is emerging from several disciplines as a way to understand human experience, memory, and personal identity from the point of view of a person in a social context. In its simplest form, the narrative approach means understanding life to be experienced as a constructed story.

Some researchers refer to sequentiality as the most attractive feature of narratives, because it is what makes narratives a good device for storing knowledge among humans. Humans do use categories, but they seem to connect them through sequentiality rather than through formal logic, states Krueger (Krueger, 2015). It is the order of events and elements that gives a certain meaning (Krueger, 2015). The term narrative and story are often used interchangeably. They have many of the same characteristics such as chronological order and thematic ordering of events (Feldman, Skoldberg, Brown, & Horner, 2004).

Narrative theory starts from the assumption that narrative is a basic human strategy for coming to terms with fundamental elements of our experience, such as time, process, and change, and it proceeds from this assumption to study the distinctive nature of narrative and its various structures, elements, uses, and effects. More specifically, narrative theorists study what is distinctive about narrative (how it is different from other kinds of discourse) and how accounts of what happened to particular people in particular circumstances with particular consequences can be at once so common and so powerful.

On the one hand, there is narrative knowledge which is also referred to as a narrative mode and a narrative position with sub typologies as narrative thinking and narrative structuring depending on the area. On the other hand, there is scientific knowledge. It is often referred to as logico-scientific mode, paradigmatic thinking, and paradigmatic mode. Many researchers see scientific knowledge as being contained in and transmitted by scientific texts, whereas everyday knowledge is circulated in stories, and thus researchers also speak of narrative knowledge-creation.

Woodhouse (Woodhouse, 2007) says that a story structure has three elements – the story (either real or imagined), the narrative (telling the events) and the narrating (the way that the story is told). This is a familiar model that resonates with the childhood experience. The vocalisation of stories is an important factor in the transmission of information, and it is not enough simply to read a story. A spoken narrative is different from a written narrative. The printed text of any talk, Woodhouse says wipes out speech rhythms, tone, pitch, variation of pace, all eye contact, actions, gestures, mannerisms, physical jerks, quirks, twitches, fleeting grins, frowns, gleams,

glares. Indeed, she states that it strikes out completely that entire enigmatic, dynamic container of infinite mysteries – the visible human form (Woodhouse, 2007, p. 63).

Narrative is an essential component of digital storytelling; it invites the past to interact with the present and helps to construct meaning and make sense of experience (Ross, 2011, pp. 1-33). The composition of a narrative requires introspection and reflection. Stories are our attempts to explain, understand and account for experience. Experience does not automatically assume narrative form, but rather we construct stories through the process of reflection on experience.

Narration of past experiences is a dynamic process because the past interacts with the present. As a memory is narrated, within a particular point in time and context, the narrator is engaged in re-storying. The process of re-storying is the reconciliation of the narrator's past with his/her identity of self in the present. While most stories are temporally ordered, not all temporally ordered accounts are 'narratives'. Catherine Boase says (Boase, 2013) that what distinguishes a story from a scientific paper or a repair manual is the criterion of 'connected succession'. This implies that there is a relation of causality and /or thematic coherence between the represented events that goes beyond the temporal ordering. In addition to having an opening and a closing, a story needs to have a point, a meaning.

What distinguishes narrative as a form of discourse is that it always has a plot. This plot does something. The plot combines the episodes and the overall story into a meaningful whole, it does so through the plot's capacity to reconfigure into narrative what was already configured in language prior to the narrative (Boase, 2013).

There is also an interesting parallel to be made between narrative thinking and scientific thinking, both of which seek to establish cause and effect relations from numerous factors. Of course, the goal of scientific thinking is to produce an abstract, context-free principle, whereas a narrative thought produces a story, which is concrete and context-bound. In narrative thinking, the role of the point of view of the 'author' is very significant, meaning that a story is personal as it incorporates the feelings, values and opinions of the person who made it. Narrative thinking also involves elements of uncertainty, inevitably since a story is a version of reality and truth, and is open to interpretation.

Jaber F. Gubrium and James A. Holstein (Holstein & Gubrium, 2007) talk of their approach as 'narrative ethnography' and they say concern about the production, distribution, and circulation of stories in society requires that we step outside of narrative material and consider questions such as who produces particular kinds of stories, where are they likely to be encountered, what are their consequences, under what circumstances are particular narratives more or less accountable, what interests publicise them, how do they gain popularity and how are they challenged.

Narrative inquiry is an umbrella term that captures personal and human dimensions of experience over time, and takes account of the relationship between individual experience and cultural context (Clandinin & Connelly, 2000). Narrative inquiry is a means by which we systematically gather, analyse and represent people's stories as told by them, which challenges traditional and modernist views of truth, reality, knowledge and personhood, says Etherington (Etherington, 2013)

From a conceptual viewpoint, my research is informed by a framework that combines Bruner's (Bruner, 2004) narratological conception of narrative. Bruner spoke of the different ways of knowing including:

1. Paradigmatic mode of thought which ... draws on reasoned analysis, logical proof and empirical observation – used to explain 'cause and effect', to predict and control reality, and to create unambiguous objective 'truth' that can be proven or disproved.
2. Narrative knowing: narrative knowledge created and constructed through stories of lived experiences, and the meanings created which helps to make sense of the ambiguity and complexity of human lives.

He says that from narrative knowing, we get memorable, interesting knowledge that brings together layers of understandings about a person, their culture and how they have created change including:

- We hear struggles to make sense of the past and create meanings as they tell and/or 'show' us what happened to them
- The shape of the story helps organise information about how people have interpreted events; the values, beliefs and experiences that guide those interpretations; and their hopes, intentions and plans for the future

- We find complex patterns, descriptions of identity construction and reconstruction, and evidence of social discourses that impact on a person's knowledge creation from specific cultural standpoints
- Knowledge gained in this way is situated, transient, partial and provisional; characterised by multiple voices, perspectives, truths and meanings.

The variety of narrative and hence story research can be partly attributed to its roots in the fields of literary criticism, rhetorical theory and poetics. In simple terms, a story is what someone tells and a narrative is a researcher's account of what someone tells. Fundamentally, narrative provides researchers with a framework through which they can explore and investigate the ways individuals experience the world around them. Stories as narratives told by individuals about their life experiences, utilise universal 'plots' assimilated from the world around them. Individuals then embed these plots into their own retelling of life events and happenings. It can be argued that because of this, stories are not creations of the individual alone but are constructed based on an understanding of the elements that guide a good narrative tale. They are, therefore, historically, contextually bound to the world around them (Pierece, Maynes, & Laslett, 2008).

Jerome Bruner (Bruner, 2004) put it well when he concluded that the primary difference between the narrative and the story is in understanding what 'makes something a story rather than, say, an argument or a recipe'. The field is unquestionably complex and the reality is that narratives can be stories, they can culminate in a story, or can simply describe an event, happening or opinion. Indeed, qualitative researchers often use the term narrative to denote to any form of text and may loosely define what they consider to be a narrative.

In a discussion paper by Dahlstrom (Dahlstrom, 2014), the author addresses storytelling as a means to communicate science to non-expert audiences. According to Dahlstrom, narratives are easier to comprehend, and audiences find them more engaging than traditional logical-scientific communication. The nature of learning from storytelling differs from that derived from more conventional scientific information, for example, from statistical data. Scientific information provides abstract truths that can be applied to a specific case, as in deductive reasoning,

which often involves a depiction of an individual experience from which an inference to a general or even a collective truth can be made.

Generally, the job of a narrative researcher is to interpret the stories people tell. As the narrative analysis has to do with 'how the protagonists interpret things' (Bruner, 2004) narrative analysis tend to ask why the story was told that way and what the storyteller means by looking at form, structure and content. Some researchers focus on the structural links among concepts or 'semantic grammar', showing that both the structuring of narratives and their content reveal key insights. Some researchers examine the narrative as a whole, whereas others break it down into component parts. But whether taking a holistic or categorical approach, the researcher takes on a particular methodology for making an interpretation (Feldman, Skoldberg, Brown, & Horner, 2004).

A detailed overview, which follows, of how digital storytelling has been used will provide examples of narrative analysis; of using digital storytelling as an arts-based methodology and the use of digital storytelling to promote practices and behaviours.

4.3 Digital Storytelling

Digital stories have been defined as hyper short, personally narrated multimedia fragments which offer points of departure for critical reflection, creative self-expression, collaboration and dialogue around issues. The process of creating media materials by individuals and groups for the purpose of social change has been referred to in various ways over the last thirty years. The labels chosen have varied from; participatory video, community video, alternative video, grassroots video, grassroots television, process video and most recently digital storytelling. In this thesis, I have chosen the terminology of "Digital Storytelling" with an abbreviation of DST.

Studies have found that empowerment and change can happen through the process of creating stories fused with technology and this section will provide the reader with examples of same. Digital storytelling has been successfully applied to projects focusing on; community development; promoting local innovation and indigenous development; therapeutic work; a voice for marginalised groups; a catalyst for community-led action; a tool for communicating with policy makers; a

means of involving users in their own research for example action research, participatory research, user-led research and as an arts-based research methodology. It has also been used for programme monitoring and evaluation and new possible applications are being continually developed.

The first experiments in Participatory Video were the work of Don Snowden, a Canadian who pioneered the idea of using media to enable a people-centred community development approach. Then Director of the Extension Department at Memorial University of Newfoundland, Snowden worked with filmmaker Colin Low and the National Film Board of Canada's Challenge for Change programme to apply his ideas in Fogo Island, Newfoundland, a small fishing community. By watching each other's films, the different villagers on the island came to realise that they shared many of the same problems and that by working together, they could solve some of them. The films were also shown to politicians who lived too far away and were too busy to actually visit the island. As a result of this dialogue, government policies and actions were changed. The techniques developed by Snowden became known as the Fogo process. Snowden went on to apply the Fogo process all over the world until his death in India in 1984.

The pedagogical method of digital storytelling was originally developed by Joe Lambert and his colleagues at the Center for Digital Storytelling in the USA and its core concept is first and foremost the personal voiceover of the narrator, emphasised by images and/or short sections of video, sometimes together with music and/or sound effects. Using video editing software e.g., iMovie, the story elements are compiled, processed and condensed into an informal time limit of usually 3 minutes or shorter, a process in which, Lambert (2010) says the individual story components seem to amalgamate or merge into something more, beyond the sum of each story component. In this research, I refer to DST as a very specific process and product that draws its theoretical foundations from the arts, humanities and human sciences.

From the previous section we have learned that storytelling is the art of sharing events in words using drama, images and sounds. Stories are shared throughout the world for entertainment, celebration, mutual understanding, education and the passing of culture and values. These principles apply within cultures, societies, organisations and enterprises. Because participants contribute their own experience and

imagination, stories are more easily remembered and have the potential to create emotional engagement and therefore, can often be more profoundly transformational than the equivalent facts and figures. Digital storytelling has emerged as a powerful medium that builds both individual and community capacity through its process. The particular interest of this thesis is the use of digital storytelling both as a methodology and as a tool for influencing change.

Digital storytelling has rapidly developed as a recognised media technology over the past decade, as understanding and knowledge of creative digital tools and distribution platforms is no longer confined to the world of professional media producers. Anyone with access to a smart phone and the internet can create their own digital story and share it with the world; a process that was unimaginable even fifteen years ago. This rapid increase in the accessibility of digital media tools, along with a free online platform from which to broadcast, has revolutionised the ways in which we produce and consume media.

Lambert (Lambert, 2009) says that when stories are completed in an environment of shared reflection, they can inspire and lead to more in-depth reflections by the storyteller's peers. Furthermore, he says that DST is about individual insight but it is also meant to be an effective group process. Current research points to the story as frequently only a small part of the total learning from the DST process. The totality of learning, or the 'narrative of knowing' is created through a participatory exchange between the narrator and listener.

Robinson and Hawpe (Robinson & Hawpe, 1986) suggest that empowerment is marked by respect for each individual in the group based not on a position of authority or individual skill, but on acknowledging that each person has a valuable and unique contribution to make, that echoes human experiences. DST has implications for the personal relationship between the participants. The process of DST can stimulate discussions and dialogues that go beyond the subject. DST studies to date show that DST improves participant's sense of community, connectedness to others in the community, empathy, collaboration, social interaction and communication skills (Lambert, 2009).

DST creates a greater focus on personalised information, provides glimpses of real-life experience, a connection with a topic as participants recognise similarities in their own personal experience and knowledge and connections between different topics and through the emphasis on key concepts. The advantage of using technology is that it allows rich stories of change to be stored, analysed and aggregated much more easily, cheaply and quickly, joining what happens on the ground to big-picture trends that can share the impact of work within a variety of audiences.

Although video recorders might be used in the creation of a digital story, they are not essential. In fact, some consider them a distraction from the end product, Lambert (Lambert, 2009) says. Instead, many digital stories rely heavily on photographs, hand drawn illustrations and other scanned-in images, along with transition effects to accompany the recorded narrative.

Sound, Lambert (Lambert, 2009) says, is one of the best ways to convey tone – through the way the voice-over is performed, the words that are spoken, and the ambient sound and music that work with the narrative. In digital stories, voice not only tells a vital narrative but it also captures the essence of the narrator, their unique character, and their connection to the lived experience.

But why does voice matter so much? In a speech, for example, we are listening for an applause line. In a lecture, we are listening for the major points, or an outline of information. But in a story, we are listening for the shape of an organic, rhythmic quality that allows us to drift into reverie, Lambert says.

Lambert (Lambert, 2009) goes on to say that there is a complex interaction between following the story and allowing associative memories the story conjures up to flow around us. In their experience, storytellers have an intuitive sense of the music that is appropriate for a digital story. Once the basic structure of the story is outlined, the next step in the process is scripting and storyboarding, or in other words, laying out how the visual and audio narratives will complement each other over the duration of the piece to best tell the story. What works is truth, Lambert says. By this, he explains that this is an author's truth about how he or she conceives of a personal way of storytelling is their style.

Human emotions can be complex and hard to communicate (Angus & Greenberg, 2011) and the audio-visual nature of DST provides an opportunity to feel the emotional experience of the creator. Hall, Thompson and Long (Hall & Thompson Long, 2018) state that communicating emotion through words alone can be a complex and difficult cognitive process, and many individuals lack the verbal skills to express themselves. Image selection, therefore, can be an enlightening and therapeutic activity. Many participants use personal photos from their past that are meaningful and often representative of complex life events. The very act of looking for and selecting these photos from their past can enhance reflection and connection to important life events.

The transitions between individual images can also help convey emotional intent and important story events. Rough, choppy transitions between images create a disjointed, abrupt sensation while smooth cross-dissolves and fades create a controlled, reflective sentiment. A slow fade between two images can create a sense of connection between them, while fading to or from a black screen can be used to separate different events and scenes within the story. Altering the style and length of transitions is perhaps not only a creative process but a reflective one as the participant works on what they want to convey.

While it is endlessly creative, the goal of DST is straightforward: the voice over narrates the story, while the images, music, pacing, transitions and effects allow the audience to feel what happened. Crafting a digital story provides a unique opportunity to explore the inner emotional experiences and sets the stage for the feelings of empowerment and pride that can result from genuine audience engagement.

It is through audience engagement that some participants come to understand, often for the first time, that their story matters, Lambert says (Lambert, 2009). There are different ways to structure DST programmes. Some researchers work one-to-one with participants over three 2 hour sessions, using the software Final Cut Pro X to edit the stories. Other projects have used a group workshop format over 2 or 3 days, while others allow participants to take i-pads and work independently.

For many, an essential element of the digital composing process is the 'story circle'. Based on a component of the 3 day CDS Standard Digital Storytelling workshop

conceptualised by Lambert et. al., the Story Circle is an in-class workshop where students share their story ideas and get feedback from others in the class.

In many studies DST is primarily about the process. The process can be empowering, enabling a group or community to take their own action to solve their own problems, and also communicate their needs and ideas to decision-makers and /or other groups and communities. Research points us in the direction that digital storytelling can assist in deeper learning on behalf of those that partake in the making of the story. It is the process of making the story and the showing of the story itself that appear to be equally important in this.

Studies show that DST can improve higher level thinking such as: creative thinking, problem solving, motivation for learning, metacognitive skills of learning, empathy, self-evaluation, analysis and synthesis, finding one's own voice and critical thinking skills. Studies further show that DST gives participants an outlet for expressing themselves specific to their personalities and an opportunity for personal resonance (examples of the use of digital storytelling is provided in the next section).

Artificial intelligence theorist Roger Schank (Schank, 1995) tells us that through storytelling it is in fact, the teller rather than the listener, who seeks to learn from the story told, as it is in the telling participants are able to interrogate and deepen their understanding of their experiences. Although very interesting, this study does not concentrate on the effect of making the stories on the story-makers, but it would make an interesting follow-up to this research.

Digital storytelling is an arts-based research method with potential to elucidate complex narratives in a compelling manner, increase participant engagement, and enhance the meaning of research findings. Rieger et. al. (Rieger, et al., 2018) state that a highly technological world is rapidly changing the definition of what it means to be an informed and contemporary researcher. This digital revolution has brought an age in which humans engage and communicate through various modalities.

Increasingly, people are documenting their lives on social media and face to face contact and virtual presence are becoming equally important as meaningful avenues for expressing lived experiences. Email, Instagram, Facebook and Twitter are some

of the digital mediums that now connect people more frequently than landlines and regular mail. There have been significant advancements in technology over the last two decades that have shaped the digital revolution. Smart phones and tablets are essentially pocket sized personal computers. ‘Apps’ shape photos and videos into engaging, personalised media content. It is critical that researchers find innovative approaches to respond to these societal shifts, Rieger says.

Drawing on a growing body of interdisciplinary research from the field of neuroscience, Groff (Groff, 2013) proposed a theory of whole mindedness for understanding the diverse cognitive processing (visual and language-based) that occurs in the human brain. Groff posits that there are three distinct, but interactive cognitive processing systems at play: visual-object (i.e., static images), visual-spatial (i.e., moving images) and verbal (i.e. Language-based). She argues that within contemporary society, the proliferation of digital technology has created a visual revolution and with that, non-verbal processing skills (visual-object and visual-spatial) now hold dominance. Individuals living in diverse global contexts are not only consumers of high-end multimodal, multi-media visual content; they are also engaged in creating and sharing it with others. Unfortunately, focused attention and integration of approaches congruent with visual processing systems have not kept pace with current research inquiry methods, Groff says (Groff, 2013). Digital storytelling offers researchers a novel medium to address visual processing systems within the research process. It integrates all three of the cognitive processing systems described by Groff and therefore, may be a research method that can facilitate a deeper level of self-expression and understanding within diverse areas of inquiry.

Furthermore, in a ‘cascading approach’, the digital stories made by people can be viewed by others (leveraging homophily – a principle that a contact between similar people occurs at a higher rate than among dissimilar people) and research suggests this to have an impact on the engagement, motivation and empowerment of individuals and the community, in relation to the subject matter (examples are contained in the following section).

As a narrative-based participatory research method, a capacity-building strategy, a dialogue inciter and a community collaboration and cohesion enhancer, digital

storytelling can be a powerful strategy for engaging individuals, Siemens states (Siemens, 2008). He goes on to argue that these digital stories can provide rich, culturally relevant first person visual and aural depictions of life: of triumphs and failures, fears and hopes, and laughter and pain. He discusses how they open up worlds of affect and intimacy, and they share – through sound, pictures, voice and video – a glimpse of another life, with whom we can listen and from whom we can learn (Siemens, 2008).

The next section provides examples of the ways in which digital storytelling has been used around the world.

4.4 Uses and Examples of Digital Storytelling

Digital Story Telling (DST) has been successfully used as a research tool in various contexts, some key examples from environmental research are outlined below, while additional examples from other fields are included in Appendix 1.

4.4.1 Native Population

The “Changing Climate, Changing Health, Changing Stories” project was a multi-year community-based capacity-building project situated in Rigolet, Nunatsiavut, Labrador. It was funded by Health Canada’s First Nations and Inuit Health Branch (FNIHB), with complementary funding from the Nasivvik Centre for Inuit Health and changing environments, from November 2009-2011. Specifically, the project utilised participatory community-based digital media, combined with qualitative methods such as interviews, focus groups and surveys, to gather data about climate-health relationships, while simultaneously creating accessible and transferrable educational health media in the form of digital stories.

The overall goal of this project was to further develop individual and collective capacities in Rigolet to understand, identify, adapt to and manage health issues experienced in the community due to changes in climate using digital storytelling methodologies.

The study examined the linkages between climate change and physical, mental, emotional and spiritual health and well-being. Their purpose was to find a method that was locally appropriate and resonant with the narrative wisdom of the community, yet cognisant of the limitations of interview-based narrative research. The team sought to discover an indigenous method that united the digital media with storytelling. Their research, Wilcox, Harper and Edge (Wilcox, Harper, & Edge, 2013) say, shares how digital storytelling can stand as a community-driven methodological strategy that addresses and moves beyond the limitations of narrative research and the issues of colonisation of research and the Western analytical project. The Changing Climate project concludes that this emerging method can preserve and promote indigenous oral wisdom, while engaging community members, developing capacities and celebrating myriad stories, lived experiences and lifeworld's.

For the project, 'method' became extremely important because the researchers were searching for a method that reflected, preserved and promoted the culture, histories, and narratives of the community, as well as complementing and informing the more standard qualitative strategies they were using (focus groups, in-depth interviews, and questionnaires).

As a method that puts the participant story and lived experience first, and that allows researchers to analyse the stories only after they have been created (and does not include the researchers until the stories are finalised and produced), digital storytelling has the potential to become a narrative method that is more a participatory and democratic form of social research, the authors point out.

4.4.2 Climate Change Example

Between 2010 and 2012 researchers at the University of Falmouth and Glamorgan in the UK collaborated with the UK Government's Department of Energy and Climate Change (DECC) and the White Loop Media Company to explore whether storytelling might provide a framework for improving engagement in the public climate change conversation. Project ASPECT (Wilson & Lewis, July 2013) built upon earlier work with flood communities and in the broader disaster management arena on the use of digital storytelling to build community resilience. It took at its starting point a particular

problem; the more DECC promoted climate change science, the more the public became disengaged. The idea was to use digital storytelling to subvert the knowledge hierarchies and expert-driven discourses that typically characterise communication in both the science and policy arenas.

Wilson (Wilson & Lewis, July 2013) reflects on the work of ASPECT by pointing to examples of the stories created and also by theorising the practice of digital storytelling as a cultural practice for sustainability. He explores notions of authority and credibility within personal storytelling and the potential for creating deeper levels of public engagement in complex policy-making areas such as climate change, whilst interrogating the democratising potential of storytelling as a form.

The stories in the project, raise critical issues about the way that the public conversation around climate change is conducted in the UK, who carries the authority within that debate and how issues around climate change can be most effectively communicated to a largely un-persuaded (or at least variably sceptical) public.

Project ASPECT began in 2010 when the Director of Communications at the Department of Energy and Climate Change in London, one of the key Government ministries in the UK, approached researchers at Falmouth University in Cornwall and the George Ewart Evans Centre for storytelling at what was then the University of Glamorgan in South Wales, with a particular challenge. Subsequently, they embarked on a creative exploration on how this challenge might be addressed. The problem cited by Wilson (Wilson & Lewis, July 2013) was this:

- In spite of extensive (and expensive) campaigns to raise awareness around climate change, scepticism around and /or disengagement with the subject area (climate change) appeared to be on the increase
- A communications strategy which was largely driven by climate change science and expert opinion did not seem to be engaging the broader public in the climate change debate. In fact, the opposite seemed to be the case.

- Government policy consultations, they found, only ever engage a small proportion of the public. Regarding climate change, it was largely those representing the polarities of the debate who had become included, leaving about 80 per cent of the population, who, in DECC terms are 'hard to reach'.

From their discussions they formed a specific research question: By recasting the public conversation into a narrative framework, can storytelling and specifically digital storytelling, broaden and democratise the debate around climate change and encourage deeper and wider levels of engagement?

With funding from the Arts and Humanities Research Council, they established Project ASPECT, an eighteen-month pilot project during 2011-2012, which set out to use storytelling to work with a range of community groups, from lifeboat crews in West Cornwall to young rappers in Peckham to explore the issue of climate change.

Over the lifetime of the project, they created a bank of eighteen digital stories with community members, dealing with issues relating to climate change, but not addressing them head on, such as food security, renewable energy, recreation and the natural environment. In the belief, that in the context of social discourse, one story often leads to another story, these digital stories were then used in community workshops to initiate and provide a narrative framework for a wider conversation about climate change. These additional narratives were then captured (largely on audio) for analysis.

Project ASPECT states that they have demonstrated how digital storytelling has the capacity to bring fresh, previously unheard voices into the climate change debate arena and thus, facilitate deeper levels of public engagement in a subject that has, up till now, been the domain of the expert. This in itself has raised interesting questions around authenticity and authority of voice, as well as the ability of personal storytelling to subvert the knowledge hierarchies that typically exist in the expert-driven discourses that are often found in both the science and the policy arenas.

Project Aspect's definition of storytelling is that as the world of digital and online communication has been transformed over the past decade, this term has begun to be used more widely, often attributed to any kind of narration within a digital context. But for their purposes, they refer to a recognised form of authentic first person narration, using digital tools to create and share the story in the multi-media format. The process of digital storytelling, Wilson says (Wilson & Lewis, July 2013), is particularly suited to individuals who have a story they wish to share but who never before ventured into the world of creativity and/or the arts.

Wilson states that the dominant creative methodology employed by today's citizen journalists or multi-media producers, is one of video clips or blogs that resonant with the audience but that borrow their structure and execution from traditional mass media forms – moving images edited together with sound tracks; pieces to camera; hurriedly composed text in traditional journalistic style – whereas a digital story can be different. It is created with still images or video, and a sustained first person narrative with no interruptions from interviewers. The resulting multi-media piece offers a very different viewing experience to the audience (Wilson & Lewis, July 2013).

With project ASPECT, the methodology that was employed was a collaborative, rather than an individual process, as the facilitator (in this case one of Project ASPECT'S researchers) works alongside the storyteller to co-create the piece, as choices regarding audio editing and selection of images were made together. Skills were transferred from researcher to participant, engendering a deeper understanding of the tools of media production and the opportunities offered for this to become a sustainable practice for individuals and groups.

Wilson goes on to say that the challenge of finding an audience also lies at the heart of making digital storytelling a practice that ensures that those who have the most to gain from listening to these new voices, hear them. All stories need listeners and in the case of ASPECT, this included policy makers, opinion formers and members of the wider public – particularly those who had yet to find themselves engaged in any way with the climate change conversation.

Wilson points out that a story can be produced digitally and shared widely within a matter of minutes. Once 'out there' in cyberspace, there is no knowing just how far it will go. By using tags, meta-data searchers, hyperlinks and so on, one story can reach thousands, if not millions of people across the globe. But will the voices be listened to? He says that if digital storytelling is to be a sustainable practice and a useful tool to uncover hitherto unheard voices, then it needs to have a route to its target audience that is more direct than the random distribution offered by the vagaries of the worldwide web, Wilson states (Wilson & Lewis, July 2013).

The stories in project ASPECT have been made freely available online, via accessible channels such as YouTube, but they have also been shared at conferences, meetings, in community settings and workshops, allowing for a contextualised viewing followed by discussion. Wilson says that it is in this arena that some of the real listening may need to be done, as unexpected voices are foregrounded in narrative spaces that are usually the preserve of the scientific experts and trained, professional communication specialists. He argues that, by listening to – and engaging with – the stories of individuals, policy makers can begin to think differently about how to engage the wider public in the climate change debate.

Wilson goes on to say that the engagement that they witnessed when screening the digital stories to community groups, individuals, staff at DECC and other informed professionals convinced them that something different happens in the room when an audience is confronted with a voice that carries such authenticity and quiet authority, based on lived personal experience. Wilson says that once policy makers and communication experts begin to see the potential that stories have to engage audiences in debate then they can perhaps begin to think differently about some of their approaches. Wilson points out that the personal or autobiographical story is a challenging concept for scientific debate. Whilst the personal narrative is primarily a recounting of events that actually happened, it is at the same time deliciously unreliable because such kinds of storytelling are closely linked to memory and memory is fallible.

A distinction also needs to be drawn, he says, between the ideas of 'truth' in storytelling, which usually relates to the material content of the narrative; 'believability'

which is more dependent on the performance of the storyteller; and ‘authenticity’ which focuses on the persona of the storyteller and their relation to the story. There is also the curious contradiction in personal storytelling in that the more flawed the storytelling performance is through contradictions, inaccuracies and lapses of memory, the more authentic the storyteller appears to be and the more believable the story becomes. He points out that we know about the unreliability of the memory and the fallibility of the human being and if the story appears too polished, too rehearsed, too perfectly rendered, then we begin to doubt its authenticity as if it were too good to be true.

Wilson states that the voices from the project are not normally voices that are heard in the climate change debate, at least not in policy forums, where it is the narratives of climate change science and the voices of climate change scientists that dominate, so that the debate becomes one around claim and counterclaim about what the science does or doesn’t tell us (Wilson & Lewis, July 2013).

Wilson concludes by saying that in many ways, it is too early to understand the full potential policy impact of project ASPECT. He certainly does not claim that digital storytelling is some kind of golden bullet that will solve all challenges around climate change communication and public engagement but he does propose DST as an additional tool in the box and that it has been successful in supporting significant engagement in the climate change discussion by individuals and groups that have previously not engaged. The work has also generated interest from other government departments who face their own challenges around public engagement, active citizenship and participative democracy. What project ASPECT has emphasised is that humans are storytelling animals, he says. We live by our stories, he believes, and hence it may come as no surprise he says, that if we reframe public policy debates as exercise in narrative exchange, we may be more successful in introducing new and varied voices to the arena.

4.4.3 Agriculture Example

Digital Green (Gandhi, Veeraraghavan, Toyama, & Ramprasad, 2009) is a research project that seeks to disseminate targeted agricultural information to small and marginal farmers in India using digital video. The unique components of digital green are 1) a participatory process for content production 2) a locally generated digital video

database 3) human-mediated instruction for dissemination and training and 4) regimented sequencing to initiate a new community. Unlike some systems that expect information or communication technology alone to deliver useful knowledge to marginal farmers, digital green works with existing, people-based extension systems and aims to amplify their effectiveness. While video provides a point of focus, they state that it is people and social dynamics that ultimately make digital green work. Local social networks are tapped to connect farmers with experts. In a four-month trial involving 16 villages (1070 households), digital green was seen to increase adoption of certain agriculture practices by a factor of six to seven times over classical person-only agriculture extension. The hardware investment was a TV and a DVD player per village, and one digital camera and pc shared among all 16 villages.

4.4.4 Pro-Environmental Advocacy and Behavioural Change

A study by Williams and Gearty (Williams & Gearty, 2015) adopted a participative action research approach for action based research projects to explore the potential for digital stories to advocate for and stimulate pro-environmental change.

Over the course of two years, the research team with the University of Bath's centre for Action Research, worked with (a) eight storytellers who were facilitated to script, voice and create their personal stories; and (b) over 90 participants whose ages ranged from 12-90 from across four rural communities around Somerset and Wiltshire. Audience participants were engaged in two workshops. At the first workshop, they watched five of the eight digital stories and discussed their immediate 3 reactions to them. At the second workshop (a few months later), they explored their thoughts, reflections and any changes in behaviour. Key findings, they report, as follows:

1. Digital storytelling was shown to be a fresh medium for advocacy about pro-environmental change for those in the 50+ age group. The digital stories were found by all audiences to be authentic and accessible and almost universally agreeable. Several participants commented on how much easier they found it to absorb information this way rather than through more factual forms of communication.
2. The most 'inspiring' stories combined dimensions of personality, storyline and the pro-environmental behaviour/activity. A storyteller did

not need to be a natural raconteur. Credibility, authenticity and passion were shown to be more important qualities. Multi-voiced or more abstract stories had less of an impact. The workshops supported participants to deepen their exploration of pro-environmental behaviour in a personal way. However, the process worked less well for those who sought expert answers, information and guidance to change.

3. There were some significant impacts on the storytellers themselves whose confidence and motivation to advocate for the environment increased as they participated in the digital story-making workshop process. All reported a desire to advocate further, some using their digital story to do so. Taking part placed practical and personal demands on the storytellers themselves requiring them to go through a process that they sometimes felt uncomfortable with. Creating trust and building confidence, therefore, was vital in engaging the storytellers in a process that was personally valuable to them.
4. The most important factor was the credibility and perceived authenticity of the storyteller; this, they suggest, means that anyone could be a storyteller providing they met this criteria.
5. A story suite is important to provide a credible mix of stories and offer a broad range of behaviours with which each audience can connect with.
6. Behaviour change varied according to the audience groups. Those that moved most were the younger and middle aged groups. Behaviour change in older aged audiences was generally low.
7. Local context was not a key variable in this research, the stories travelled well between communities and travelled best as a suite of stories. The credibility, perceived authenticity and believability of the storyteller were more important than the role they played in the local community
8. The process provided the potential to build and strengthen community ties. Whilst the stories in the host community served to reinforce a strong, pre-existing sense of local pride, participants in an outside community were also stimulated to localise their response and discuss community-level action.

9. However, the effectiveness of such stories to build lasting change across communities was limited in this pilot.

This section has provided an overview of some of the ways that digital storytelling has been used in a variety of different environmental studies and the following section now turns to further discuss the use of DST specifically as a research methodology.

4.5 Storytelling as a methodology

In this technological age, storytelling is moving from oral and written to digital formats, creating many methodological opportunities for researchers and practitioners (Lang, 2019).

As we have seen from the last section, piloting of the use of digital storytelling as a narrative-based social science method, opens up some innovative new terrain for conducting and sharing narrative research. As a method, it not only addresses the conceptual and practical issues and limitations associated with narrative research but it also works to alter, reverse and/or disrupt the 'researcher' and 'researched'. The stories created, and the voices and lived experiences within, are an important, rich and powerful source of data that have not been written, pre-structured or altered by the researcher (Wilcox, Harper, & Edge, 2013).

Digital storytelling and the process involved in the creation of a personal video narrative begins to dismantle the hyphen between 'researcher-researched' and 'teller-listener' and can place the researcher into the position of 'listener', rather than a 'verifier' or 'analyser'. Digital storytelling removes the researcher from a position of 'narrative creator' and instead, places the power of creation with the individual workshop participants. In this situation, the researcher is removed from the storytelling and facilitation process, and instead assumes the role of listener. This positioning is very different from the majority of narrative research, where researchers become collectors, or gatherers, and then story re-creators. Digital storytelling then allows the creator-tellers to share stories in the first person, which are entirely their own. While interpretations and analysis can certainly be made of these digital stories, the voices, experiences and wisdom belong to the teller.

Narrative inquiry often seeks to personalise and also to engage proactively with its research population through deliberate intervention, as research with, not on, people. Stories do not reveal one, single, discoverable truth because truth is a matter of degree and perspective. In this respect, using the telling of a story as a research tool rests on a premise that is starkly different to that of a conventional scientific method. Both the established scientific method and the storytelling research method, each provide a distinctive way of ordering experience and constructing reality, and using the two knowledge systems to complement and enhance each other might provide a broader and more in-depth insight into an experience than using one method alone (McCall, Shallcross, Wilson, Fuller, & Hayward, 2019).

Over the past decade, interest in the use of arts-based genres in qualitative research has grown. Dance, poetry, body-mapping, digital storytelling and theatre have all been used to generate data about a research topic (Emert, 2013). Engagement with arts genres in the research process is conducive to co-creation of knowledge between researcher and participant, somewhat diminishing the power hierarchy inherent in such relationships. Arts-based research is valued for the richness of the data produced, as well as its amenability to engaging knowledge translation strategies, which allow findings to be disseminated and understood by the general population, rather than being relegated solely to the realms of academic readership (Boydell, Gladstone, Volpe, Allemang, & Stasiulis, 2012).

DST necessarily involves self-representation – a story from ‘the inside out’. It, therefore avoids, to a large extent, imposition of researcher or ‘outsider’ views of the individual and the group to which he or she belongs.

Second, DST lends itself in philosophy and execution to a participatory research model, which favours a flat hierarchy between participants, researchers and other stakeholders (Wilcox, Harper, & Edge, 2013). Participatory research (PR) encompasses designs, methods and frameworks that use systematic inquiry in direct collaboration with those affected by an issue. PR engages those who are not necessarily trained in research but belong to or represent the interests of the people who are the focus of the research, in this instance, the farmers in the story-makers group. Instead of the “subjects” of traditional research, PR collaborates with

stakeholders, community, constituents, and end-users in the research process and co-constructs research through partnerships.

Hence, participatory research is carried out with and by local people rather than on them. PR is a collaborative and empowering process because it (a) brings people together around common themes and problems (b) validates their experiences as the foundation for understanding and critical reflection (c) presents the knowledge and experiences of the researchers as additional resources and (d) contextualises what might have previously felt like personal, individual opinions and/or problems. Participatory research validates popular knowledge, personal experience, feelings and artistic or spiritual expressions as useful ways of knowing.

One of the rationales for community participation in research is the assumption that people understand many aspects of their situation better than outsiders do.

Practitioners have used group discussions, photography, theatre and traditional tales to draw on popular knowledge and in this instance, I have used DST. In this type of research, group discussions and projects typically attempt to reduce participants' feelings of self-blame and incompetence, and try to relate personal problems to unequal distributions of power in the community and the society. Research studies show that participants often become visibly more confident and effective as they speak out in discussions and learn that others share some of their experiences. This was most certainly evident in the workshops with farmers where at the start of the process, farmers felt that they were being blamed to a certain extent for environmental damage but after the group discussions, felt more positive and confident. Many projects, such as mine, strengthen or create a community network and foster critical knowledge.

Characteristics of the DST process mean that when applied ethically and in a spirit of genuine collaboration and respect, a condescending 'top-down' research practice is avoided. Such participatory approaches encourage active participant involvement in decision-making about the research question, and in how the research is conducted and used. The visual nature of DST also makes it more accessible to people with disabilities, especially those with limited verbal and literacy skills (Manning, 2010), so it is also a useful methodology in this context.

Participatory Research has a multitude of benefits including research that is informed by and relevant to real-world contexts, results that can be more effectively translated into community and non-academic settings, and research quality and rigor that is improved by the integration of researchers theoretical and methodological expertise with non-academic participants' real-world knowledge and experiences.

However, to be clear, although this study employs a participatory research approach (as above) this study does not use Participatory **Action** Research (PAR) which is an approach to enquiry which has been used since the 1940's. PAR draws on a wide range of influences, both among those with professional training and those who draw on their life experiences. Many draw on the work of Paulo Freire, an exiled Brazilian educator with roots in Marxism and critical theory. His book "Pedagogy of the Oppressed" is the most influential work in participatory research. Freire argues that teaching and research should not be dominated by experts but should be based on dialogue with a community of oppressed people. Through dialogue and collective action, people can develop critical consciousness, learn the skills they need to improve their situation and liberate themselves. It involves researchers and participants working together to understand a problematic situation and to change it for the better. PAR focuses on social change of a particular group, and often seeks to 'liberate' participants to have a greater awareness of their situation in order to take action.

The primary similarities in the two methods are active participation and high levels of commitment from the researcher and the participants to the research problem and active learning. However, in addition to involving those most affected by a problem, PAR engages them in planning, carrying out and applying the results of the research. In this way, groups collaboratively commit to the research process for both a scientific goal of furthering the research but also to a tangible problem solving goal such as, for example, whether or not to close a manufacturing plant.

In their book "Participatory Action Research" Chevalier and Buckles explore the vast literature relating to PAR and state that oftentimes, the use of the term has been reduced to frameworks where people contribute data to the enquiry process and not to the tangible action is the possible outcome of PAR (Chevalier & Buckles, 2019). Baum et. al (Baum, MacDougall, & Smith, 2006) support this and explain that PAR

differs from most other methodological approaches which enables researchers to work in partnership with communities in a manner that leads to action for change. In this sense, PAR seeks to understand and improve the world by changing it. The authors go on to say that PAR differs from conventional research in three ways: firstly, it focuses on research whose purpose is to enable action. They describe action as being achieved through a reflexive cycle, where participants collect and analyse data, and then determine what action should follow. The resultant action is then further researched and an iterative cycle perpetuates data collection, reflection and action. Secondly, the researched cease to be objects and become partners in the whole research process: including selecting the research topic, data collection and analysis and deciding what action should happen as a result of the research findings. Thirdly, PAR advocates that those being researched should be involved in the process actively (Baum, MacDougall, & Smith, 2006). In this sense my study, focused upon understanding the meaning of sustainability to farmers using a participatory research methodology, but did not seek to find solutions and take action as a PAR method would do.

Armed with examples of how DST has been used as a methodology, I formulated and implemented my own methodology and this is outlined in detail in the following sections.

4.6 Background Information

Before detailing the methodologies for each of the findings chapters, the following section will provide some background detail in terms of how this study was conducted including the following:

- Transdisciplinary Collaboration
- Practices Identified as 'good environmental practices'
- Incentives
- Location of farmers

4.6.1 Transdisciplinary Collaboration and the Role of Carbery

Initially, when I envisaged this study, I believed that it would require resources to complete the primary research and so I applied to a research call from the

Environmental Protection Agency who were asking for submissions in relation to social science research projects, particularly on behavioural change. I was successful in this submission and the Environmental Protection Agency provided a sum of €26,000 to assist with completing the research. This had some matching funding from a Cork County Council owned company called Macroom E, where I worked as General Manager in 2016.

Once I had some finance in place, I looked to collaborate with a farmer representative organisation or food company, as I believed that this would provide a gateway to accessing farmers. Initially, I approached the Irish Farmers Association (IFA) as they were running a programme called SMART farming with farmers which was focusing on environmental sustainability. I met with the SMART Farming manager in Dublin and presented the ideas for the study, but unfortunately, he was not interested at that time.

Next I approached Carbery Foods as they had developed an environmental programme for farmers called the Carbery Greener Dairy Farms Programme in conjunction with Teagasc. I became aware of the programme as their sustainability manager had made a presentation on the programme at a conference held in the local area.

Carbery Group Ltd., based in Ballineen in West Cork, is an international manufacturer of speciality food ingredients, flavouring systems and is an award-winning cheese producer. The company is owned by four Irish dairy co-operatives and employ more than 700 people. They manufacture from 8 facilities worldwide, including Ireland, UK, Italy USA, Brazil and Thailand. I initially made contact with Carbery through their sustainability manager and as he was interested in the research I proposed, he arranged a number of meetings with other managers in the company.

At the time, it was a little difficult to convey to them what the digital stories would 'look like' as I could not find another digital storytelling project involving farmers and sustainability. But I had found on the internet some other digital stories from the UK so at the initial presentation I showed them these stories but these did not gain their confidence. They were concerned that if the videos came out badly, that it could affect their brand, which I understood. I hadn't conducted a study like this before

also, so I could understand their concerns as it was 'a leap of faith'. The fact that the study was producing digital material, which could end up on the internet and that once it was 'out there' on the world-wide-web, it would not be possible to control it, was a legitimate concern for the company.

At this point, I assured them that the videos would only be used for my research, the parameters of which I outlined clearly. They were also concerned that the farmers might find the experience difficult in terms of using the technology but I assured them that they would be given support and training on all aspects of developing and editing the stories. The subject was brought to a board meeting of Carbery and after some discussion on the concerns, it was agreed to progress with the project.

Their interest in the project lay, I believe, in promoting the environmental programme they had been running to their other farm suppliers (so that it would increase the number of farmers joining the Carbery Greener Dairy Farms Programme) and also to promote their focus on environmental sustainability to their customers.

The key to the success of the partnership was to have a good open and collaborative communication between myself and the company. I found their collaboration extremely useful as I believe I would have found it harder and more time-consuming to engage farmers in the study without them. Essentially, I believe that the farmers displayed more readiness to be involved, due to being invited by Carbery.

In the background chapter to this thesis, we explored the range of factors that play a role in the arena in which farmers operate, from a local, national and international perspective. Food companies have a huge level of influence in this space and as we have seen from the former chapter, these companies, for the most part, are aligned with the global agenda of increasing food production. Dairy farmers are dependent on food companies as it is these companies who buy the milk from the farmer and also set the price of milk and thereby the farmers income. Naturally then, Carbery Foods was an important player in my research area. I was conscious in embarking on this study, that I wanted to be in charge of my research and to operate independently of outside influences that may have presented themselves. I selected Carbery Foods as it presented an interesting structure in the sense that the company is still wholly owned by the four West Cork co-operatives rather than private shareholders. In this sense, farmers still control the food company through their

membership of the local co-operatives, as opposed to say, a food company such as Kerry Group. There are few remaining places where farmers still own and control the food company to whom they supply and in this sense, Carbery Foods was a rare entity and a very suitable vehicle for my research.

All research is constrained by extraneous forces in wider society, and the farming community are no different in this context in terms of the groups and organisation's to which they belong. However, besides initially having concerns regarding engaging with this project (in relation to their corporate brand) and assisting with introductions, Carbery did not influence the research in any way.

In terms of the process, farmers received a phone call from the Sustainability Manager of Carbery introducing me and the research study but I then met with the farmers independently on their own farms and in this sense, I could discuss what I chose as relevant to this study. In terms of the questionnaires used in this study, once they were drafted and reviewed by my supervisor, they were not subject to any changes by Carbery Foods. I also liaised directly with the four co-operative managers on a local basis, in terms of communication about this research study. The digital stories submitted by farmers were sent directly to me or were collected (downloaded) directly from the farmer. The stories when shown at the advisory group, which included Carbery, were not subject to any changes. In these ways, I believe Carbery had a beneficial influence in terms of an introduction to the farming community but they did not stop, change or prevent any parts of the study itself.

Along with collaborating with Carbery Foods, I set up an advisory group for the project. This was a further method of communication and collaboration which would involve parties relevant to the research. I recognised from the literature review that trans-disciplinarity is very important to research on sustainability. I invited Teagasc to join this group, as they were the technical advisors to the Carbery Greener Dairy Farms Programme and also they brought a high level of agricultural science background to the study, which was a useful context for my research. Two staff members, both of whom were directly involved in the Carbery Greener Dairy Farms Programme (and both of whom had PhD's in the area of agricultural science) joined the advisory group. One of my PhD research supervisors from University College Cork also joined the group. The advisory group met six times during the study and

was extremely useful in terms of giving advice for the operationalisation of the research. One of the key areas of advice was in defining what they considered to be good environmental practices and this is outlined in the next section.

4.6.2 Expert Defined Practices

The study addressed the area of change in terms of environmentally good practices on farms. As a starting point, I needed to define some examples of what these practices were so I consulted with Teagasc, who were the technical advisors to the Carbery Greener Dairy Farms Programme and they provided me with the following list (verbatim) in terms of what they referred to as 'defining practices'. I used this list throughout this study with different groups being asked if they had or had not adopted the practice and if they had not, if they intended to adopt the practice and if so, when.

Soil: In the first instance, all farmers were encouraged by Teagasc to soil sample all paddocks / fields as this practice was sporadic at best. From this soil sampling, it was discovered that 87% of the soil samples showed soil infertility and there were big issues with soil PH in particular. The best way of correcting this, Teagasc believed, is through lime spreading and through the Carbery Greener Dairy Programme, farmers went from spreading 8 tonnes of lime a year to 111 tonnes a year. This, Teagasc, told me reduced the PH levels as the PH levels had been corrected. Soil test phosphorus (STP) levels were identified as being low in the analysis of the 2012 data, therefore advice was given that more fertiliser P could be utilised on farms. This resulted in the fertiliser P imports increasing from an average of 5.8kg P/ha in 2012 to 9.2kg P/ha in 2014.

Plate Coolers: Research showed that milk cooling was inefficient. A significant number of farmers installed new plate coolers with good results.

Water Leaks: As all farmers had water meters installed, it was possible to measure what the required amount of water should be for various processes, this in turn meant that farmers could identify water leaks and a number of them did through the Carbery Greener Dairy Programme.

Rainwater Harvesting: Some of the farmers installed rainwater harvesting systems to conserve water.

Hot Water Heating at Night: Because most of the farmers had night rate electricity, they were encouraged to heat water at night which had significant economic benefits.

Solar Panels: Some farmers installed solar panels to heat water.

Slurry Spreading: Farmers were encouraged to spread slurry on Index 1 land (poorest type of soil fertility) even if it meant drawing it to longer distances. Farmers were also encouraged to a greater shift of Spring application and a shift to the trailing shoe application of slurry.

More Clover: Some farmers were encouraged to grow more clover as it fixes nitrogen and can also increase milk production.

Biodiversity: Farmers were encouraged to maintain semi-natural habitat cover on farms.

Breeding: Farmers have been encouraged to breed cows with higher Economic Breeding Index (EBI) as these cows are more efficient, last longer which ultimately means less replacements which is better for the environment in terms of emissions. Increasing milk yield and composition also increases the efficiency of production, which decreases emissions per unit of product.

Longer Grazing Season Length: Farmers have been encouraged to get their cows out to grass earlier in the Spring, this means the cows eat less silage and a reduction in the proportion of dietary energy lost as methane.

Improving Nitrogen Efficiency: Improving nitrogen efficiency leads to improved utilisation of N by plants and lowers losses to air and water, through Carbery Greener Dairy Farms, farmers were encouraged to spread more urea than CAN as it requires less energy to produce. The following section outlines how I used incentives for this study.

4.6.3 Use of incentives

This research study depended on farmers making their own digital stories which meant that participants would need to be equipped with the necessary technology. I was unsure that farmers would have access to the software to make their stories and

also that all the stories would be made of a similar quality and of a similar format. I did not want to be in a position of receiving the stories in all sorts of formats and have difficulty in using them. From the research money allocated from the EPA, I bought ten Apple Tablets so that these types of issues would not be a problem for the study. The advantage of the tablet was that it had a camera and video function and also had the editing software on the one device. This meant that farmers would not have to take photos for example on their phone or digital camera and then upload them. My aim was to make the process as simple as possible and try to reduce any areas of difficulty that the farmers might have.

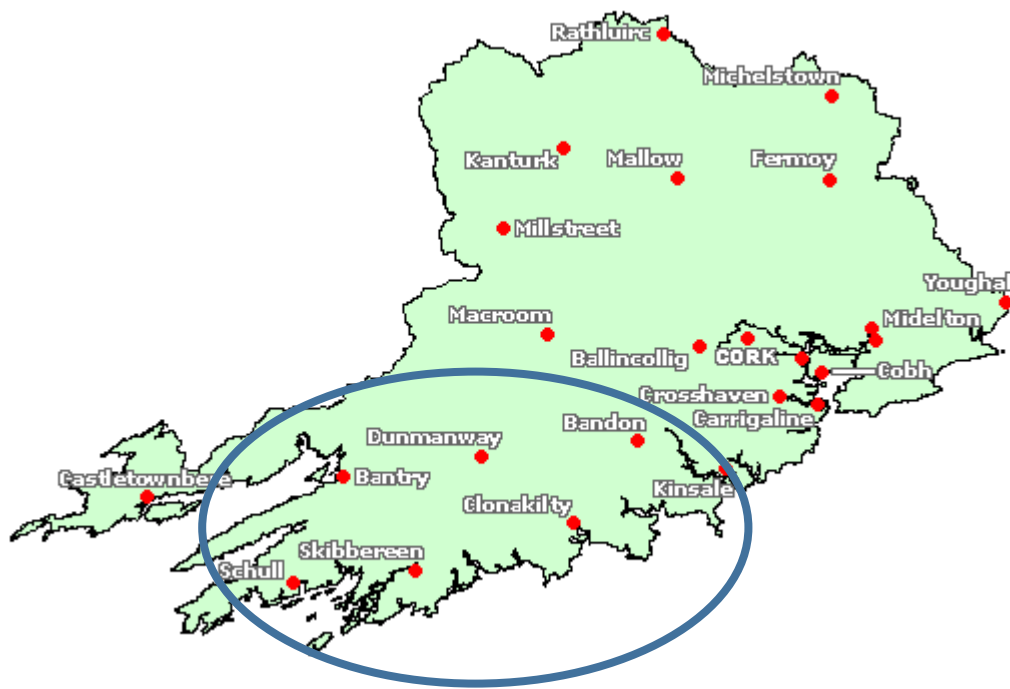
The cost of each tablet was less than 500e each and farmers were allowed to keep them after they took part in the study and had returned their story.

There are a number of digital software programmes available and in this instance, I chose iMovie as the one that I would employ for this study. From discussions with technical people in the field, this appeared to be a programme which had good graphical and editing functions. However, if a study was done with Windows Movie Maker, I believe that this could have turned out equally usable. iMovie was available on the tablets that I purchased for the study.

I also bought some “all for one” vouchers from the research money and used this to thank and incentivise farmers to take part in the study.

4.6.4 Location of Farmers

All of the farmers were based in West Cork in a geographical region covering Bandon, Barryroe, Timoleague, Dunmanway, Schull, Drinagh, Skibbereen, Rosscarbery and Clonakilty. Cork County is located in the Southern part of the Republic of Ireland as illustrated in the map below. The research participants were located in the West part of the County as per map below.



4.6.5 Selection of Farmers

Farmers were selected based on their participation in the Carbery Greener Dairy Farms Programme. There were a total of 19 farmers who had undertaken the programme and it was decided that farmers would be randomly selected based on the co-op to which they belonged i.e., the names of the four co-operatives who supply Carbery Foods were put in a hat and the CEO of Carbery Foods picked two names randomly. Those chosen were the co-operatives of Drinagh and Lisavaird. These farmers were then contacted initially by Carbery and then by myself to ask them to take part in the study. All ten farmers who were asked to participate agreed to take part in the study.

By way of an introduction, I made my own digital story (which I animated) explaining the nature of the research and why I was doing it and as part of this video, I asked them to get involved (see video material). I then emailed this to the farmers with a request to meet with them and followed this up by phone. The visits were arranged a few days in advance with the farmer and farmers were given the choice of either meeting me at their farm or to meet me in a hotel nearby. All farmers chose to meet

at their farm and so I visited each of them over a number of days and I was welcomed to their homes.

4.6.6 Ethics

There are a number of ethical principles that have been adopted in undertaking this research. These principles emphasise the need to (a) do good (known as beneficence) and (b) do no harm (known as non-maleficence). Typically, researchers do not intentionally go out to cause harm, rather it is the **risk** of harm that needs to be minimised. In practice, these ethical principles meant that as a researcher, I needed to: (a) obtain informed consent from potential research participants; (b) minimise the risk of harm to participants; (c) protect their anonymity and confidentiality where appropriate; (d) avoid using deceptive practices; and (e) give participants the right to withdraw from the research. The following sections discuss these ethical principles and their practical implications in relation to my research.

Obtaining Informed Consent from Participants

Informed consent means that participants should understand that (a) they are taking part in research and (b) what the research requires of them. I provided such information to participants including: the purpose of the research, the methods being used, the possible outcomes of the research, as well as associated demands that the participants may face. I did not leave out any material information; that is, information that may have influenced whether consent would (or would not) be granted.

I explained to the farmers the nature of the research and gave them some more detail in terms of what would be involved. I asked farmers to sign an agreement which stated how the videos would be used (please see appendix 2) and answered any questions that they had. The agreement explained: what the study was about; what they were being asked to do and the ways in which the videos would be viewed. Here, I believe that the partnership with Carbery was very important as they assured the farmers of my intentions and that the video content would be used in the

way that I had stated. The form included my contact details, should they have any questions at the time or in the future.

I gave them the equipment that they would need to make their story and re-assured them that there would be upcoming training in how to use the software. I asked them to answer the questionnaire I had devised and I also took a photo of the farmer on his farm which I made into a video (of all 10 farmers) which I played at the digital storytelling workshop so that farmers would identify as part of the digital storytelling group. In all instances, farmers were content to sign the agreement, answer the questionnaire and to get their photograph taken.

Minimising the Risk of Harm

Ethical principles provide guidance that participants should not be harmed. There are a number of types of harm that participants could be subjected to and these include:

- Physical harm to participants.
- Psychological distress and discomfort.
- Social disadvantage.
- Harm to participants' financial status.
- An invasion of participants' privacy and anonymity.

Despite asking farmers to sign the agreement in terms of the use of the digital stories, I was aware that I may have to abandon a participant's digital story if I felt in any way that by making the story public that it would be harmful or bring injury to the storyteller. Examples of this were if farmers shared private information which could make them vulnerable. To deal with this, I was conscious when reviewing all of the videos of any negative impacts which may arise from the video's being viewed by the wider population.

All of the videos were also viewed by the members of the advisory group before the second stage of the research (including UCC, Carbery, Teagasc and myself) who I organised to meet as a group for two hours to view the video content and deal with any issues that may arise. The group agreed that there were no issues of ethical concern.

Even though, this situation did not arise in this research study, it would be something to be mindful of, in other research undertaken along similar lines. In undertaking this research, I ethically had a number of decisions to make. My primary concern throughout the research was that in the making of the stories, that it would not have an adverse impact on any of the farmers. Examples of this would include if farmers chose to divulge information or emotional content that was shared on the internet and that it had any negative reactions which could cause offence or hurt to the farmer, from the general public. At the top of my concerns, was that social media commentators may not be kind to the participants in their opinions of the story. The workshop was important in this regard as it discussed what information farmers would include in their story and allowed them the space to consider this in a group format and also by being split up into groups of two for some exercises. When the stories from farmers were submitted, there was one story that stood out in terms of emotional content. I was conscious that this participant's father had died during the making of the story and I wanted to be sure that he was happy to have this digital story released as this would obviously have been an emotional time for him. As it turned out, the participant felt the making of the story came at a 'good time' in that he had a chance to share beautiful memories of his father. In this way, sometimes digital stories can be a way to assist in emotions such as grief. I was satisfied that the participant was happy to share this video. There were no negative repercussions for him and indeed it served as a positive experience. I noted that there was one comment on Twitter (after his story was played at a UN conference in Rome) which said that the story was a 'romanticised view of Irish farming in Ireland' but this did not cause offence.

In relation to the workshop itself, one of the key elements was to share with farmers what a digital story would look like. Dr. Tisdell had sent me her own story in advance of the workshop. This, too, was a story about her father dying and when received, I wondered how it would 'come across' to the farmers in my research group. I showed it to colleagues who felt that it may not be appropriate as it was such a personal account and that maybe the story told by an American would not 'translate' to a traditional Irish audience. Similarly, the EPA representative and the Carbery representative had the same sort of concerns. I decided to go ahead with the workshop that Dr. Tisdell had planned as the purpose of the research questions was

to investigate the emotional responses of people to subject matters, so this digital story was included in the workshop. The result was completely different to what I (and the others consulted) had anticipated. The group warmly received the story and gave a round of applause after it was shown. It also caused the participants to open up and share their own stories. I think that this was an important lesson for me and for future research.

Protecting Anonymity and Confidentiality

Protecting the anonymity and confidentiality of research participants is another practical component of research ethics. The story-tellers were, of course, identifiable in their videos and were aware of this and how the videos would be used (as per last section). The other research participants i.e., those who viewed the videos and answered questions and those who answered other questionnaires as part of this study, were informed that the answers that they gave would be confidential. The information from these questionnaires was analysed either by quantitative methods in tabular or graphical formats or as segments of text which were not attributed to any one participant but as an example of a theme that was arising from the research.

Avoiding Deceptive Practices

Another component of informed consent is the principle that participants should be volunteers, taking part without having been coerced and deceived. All farmers were volunteers in the research and this was also included in the agreement they signed.

Providing the Right to Withdraw

Ethical principles guide us that research participants should always have the right to withdraw from the research process. Furthermore, participants should have the right not only to withdraw but to withdraw at any stage in the research process. This was also included in the agreement signed by farmers and communicated by me when I met them. I was conscious that as a code of conduct, when a participant chooses to withdraw from the research process, they should not be pressured or coerced in any

way to try and stop them from withdrawing. However, no farmer requested to be withdrawn from this research study.

4.6.7 Commitment by Farmers

Story-makers were asked to commit to the following:

- a) To meet at the start of the process and complete the questionnaire (detail of the questionnaire to follow)
- b) To commit to making their own digital story on “what sustainability means to them on their farm”
- c) To attend a workshop with the other farmers and to learn about DST and how to make their story
- d) To be given support and help with the making of their story, if they needed it
- e) To produce their digital story and agree to it being shown to other farmers locally
- f) To agree to have their digital stories shown to the wider community through the internet

4.6.8 Technical Considerations

As outlined, farmers were supplied with an Apple tablet so they could access the software iMovie in order to make their story. In case they found it difficult to use the screen, they were also provided with a keyboard.

The workshops and subsequent meetings with the participants showed that the research participants who had little or no experience of using film technology could rapidly become competent with the camera function, the video function and the iMovie software. This was aided by the participants involving their wider family in the research, most particularly, their children (with transition year students in particular).

The most common mistake from the literature available was that participants would set up the camera across the room from someone, then zoom in on their faces to frame the shot. The problem with this is that the standard built-in microphone or home video camera takes sound from all directions and is quite sensitive, and as a result, the voice becomes lost in the room. Along with this, sound loss is even worse

outdoors. The solution was to provide a microphone to the participants of the study so that it would pick up sounds that are immediately in the direction of the microphone.

This aspect of the study took quite some time to decide upon in terms of consulting technology shops and examining online advice and recommendations. It was an important part of the research as if it had not been set up correctly, the digital stories produced may have been of poor quality (technically).

4.6.9 The Workshops and Support

Making a digital story involves some degree of creativity, in using a technology and software to transform an experience into an artefact that can be viewed by others and potentially also assessed. I believed that farmers would require some training and support to do this and I decided, based on the literature review, that this would best be done as a facilitated group process.

Farmers were asked to attend two half day workshops which were held in the Celtic Ross Hotel in Rosscarbery (located near to where the farmers lived) and the two workshops ran on consecutive days, the 26th and 27th April 2016. The first half day workshop was run by Dr. Libby Tisdell, who is an American professor and expert in digital storytelling. This workshop was a creative space for Dr. Tisdell to discuss what storytelling was, her own experiences and for the farmers to start to think about their own stories that they would make and to undertake some exercises to 'get the creative juices' flowing. Farmers were given a one-page guidance sheet at the workshop and this can be found in appendix 3. Day 2 was a workshop to demonstrate the use of iMovie and to train farmers in the use of same in making their stories.

All 10 farmers in the study attended both workshops. A number of farmers called me in advance and asked if they could bring their wife or son/daughter with them and I was happy to invite them to the workshop also. There were a number of reasons for their requests including 1) that the farmer felt a bit nervous in terms of what would be required of him and if he would be able to produce the story 2) that it might be a fun activity to do with the children and they wished to involve them and 3) simply because it was of interest to other family members. In the vast majority of cases, the

stories became a 'family affair' but in all cases, the actual story was led by what the farmer wanted to say. It was interesting that there was a determination to tell their own story, as I had been initially concerned that it may have been 'pawned' off on the teenagers in the family, but this was certainly not the case.

In total, at the workshops then, there were 18 attendees (the ten farmers and 8 associated family members). Along with myself, a representative of Carbery Foods and of the Environmental Protection Agency also attended the event.

Farmers then returned to their farms and were asked to make their stories within 4-6 weeks and all farmers did so. Support was given to the farmers in terms of visits to help with the technical aspects of the story-making on computer. These stories are now publically available for viewing on www.carbery.com.

To help storytellers identify the emotions in their story, they were asked a series of questions regarding their process, such as 'as you shared your story, or story idea, what emotions did you experience? In particular, the workshop asked questions such as: What makes it your version of the story? How does this story show who you are and how you feel about sustainability?

Next, farmers were asked to explore what images they could use to convey their meaning, and they were asked 'why this image?' 'what is it conveying to you'. Once they had some idea about the meaning they want to convey with their visuals, they were helped to decide how to find or create these images, and how they could use them.

Once the basic structure of the story is outlined, the next step was scripting and storyboarding, or in other words, laying out how the visual and audio narratives will complement each other over the duration of the piece to best tell the story. At the workshop, farmers started to write notes about what their story was going to be about. Farmers also learned that one of the benefits of story boards is that it could clarify what they do not need and saves time in terms of scanning, photographing, shooting, designing, or recording things that don't fit into a particular story.

In an effort to help the storyteller, I provided a formal constraint in the production of the digital stories to a word count of 250-375 and fewer than twenty images or video segments. I came up with this guideline as from the literature, the guidance was that

if the digital story is too short, then it's hard for the viewer to recognise what's being shown, and if it's too long, boredom can set in (Lambert, 2009). I was conscious of the two pronged approach to this research, not only in investigating the meaning of sustainability but also that the stories would be shown to other farmers in the second stage of the research.

The vast majority of farmers went over the time guidance given. The stories were intended to be 1-3 minutes long but many of them were 4-5 minutes. However, once the advisory group viewed the videos, it was felt that they were compelling enough to keep the interest of the watcher, and so none of the stories had any further editing from when they were submitted.

The recorded voice of the storyteller telling their story is the most fundamental part of a digital story – not the music, video or narrated story. Sound is one of the best ways to convey that tone – through the way the voice-over is performed, the words that are spoken, and the ambient sound and music that work with the narrative. The process of moving from a journalistic, technical or official voice towards a more organic and natural voice is often difficult. It is as if we are trying to merge the two different parts of our brains: the analytical and the emotive, says Joe Lambert (Lambert, 2010). Most of us, he says, can't switch back and forth without getting at least slightly confused. The official voice is the voice that we have been taught for formal assignments, it is the voice of dispassionate authority, Lambert says, useful perhaps in avoiding misunderstandings but deadly as a story.

One suggestion at the workshop was to get feedback by reading material aloud to someone who we know well, and asking him or her to identify which part is true to our voice.

I was aware from my research that often participants in digital storytelling groups suffer from a 'blank page syndrome' and that the weight of filling a blank page can often result in difficulty getting started. The workshop gave various writing exercises and guidance in this regard. The writing exercises were done as a group process with the 'class' spending ten to twenty minutes writing down whatever comes to mind and sharing it with each other. The farmers were shown personal stories made by the facilitator, Dr. Tisdell, including one of her experience of her father dying, which resulted in a round of applause from the participants. This emphasised the emotive

quality of digital stories. The shared themes and ideas appeared to prompt people to connect with each other. Interestingly, the spirit of the workshop at the time seemed to be one of pride – that the farmers felt that they were being consulted and that they had something to say. This theme of pride is continued in the stories that farmers made.

The second day of the workshop asked farmers to bring their Apple tablets and was a half day showing the farmers how to use the device. Interestingly, there was no difficulty with this stage of the study and all farmers felt at the end that they would be able to make their stories. After the workshop, there was a lunch for farmers and collaborators which allowed further discussion and any final questions to be asked one to one.

One of the interesting areas to arise at the workshop was that farmers wondered if they should each concentrate on a particular practice on their farm so that each person could cover one topic. This seemed to be based on wanting to offer guidance to other farmers so they could pick subjects that would be of particular interest e.g., how did a farmer fix water leaks on his farm or about soil fertility tests. I believed that this was a good indication of their enthusiasm for the digital stories but brought them back to the research question as to ‘what does sustainability mean to them on their farm’. In this sense, I assured them that say, if they found fixing water leaks to be very important, by all means they could do their story around that, but they needed to remember at all times, that they were to answer the question.

If other researchers are attempting a study of this nature, I would recommend that they should be mindful that participants need to keep their focus on the question that they are being asked. As digital storytelling is, in this guise, a ‘hands-off’ method of data collection, it may be easy for the participants to lose a little focus perhaps, as the researcher is not there to guide the process as they would be in an interview setting. The farmers went on to discuss this with Carbery Foods after the event, but I continued to give the guidance of answering the research question and all farmers did this.

This does not mean that producing stories based on particular subject matters would not be an interesting study. In fact, it was some of the feedback from some of the viewers who watched the stories (i.e., some would have liked to have one video per

environmental practice) but these stories were being used as research data to answer the meaning of sustainability to farmers. A focus on particular subjects or even stories where farmers could demonstrate how they adopted certain practices on their farms was discussed after this study was completed and this could certainly be a follow-up to this study or even as a use of training to support other endeavours by the stakeholders.

4.6.10 Data Collection

The data collection method for this part of the research was via using digital storytelling as an arts-based research method (as outlined in the previous section) and this is covered in the following sections, along with how the data was analysed once collected.

Once farmers had completed the workshops, they were asked to have their stories ready within 4-6 weeks. All farmers had the digital story ready within this time and all stories were collected by June 2016. As the files were large video files, on the occasion where farmers could not use file sharing such as Google Drive or Drop Box or because they didn't have enough broadband connectivity, the farmers were visited and stories were copied onto an external hard drive. I was conscious of not losing any data so on occasion, a local enterprise centre with good broadband such as the Ludgate Hub in Skibbereen was used to back up the stories. Once I had the stories, I could then transfer them onto a private YouTube channel or put them up on Vimeo so that they could be shared using password protection.

4.7 Analysis of Stories

Although, most of us are adept at interpreting stories we are told in everyday lives, rigorous methods of analysis are needed when stories are interpreted for research. This need is rooted in the very nature of stories, first, because they often contain multiple meanings and second, because storytellers rely on tacit assumptions shared with their listeners. In addition, stories are often told in such a way that that the listener gets "the gist" of the story, but when the oral communication is transcribed into written text, the reader may have difficulty deciphering the meaning.

My analysis wished to present the implicit argument made by the storyteller. My concern was not with whether the story told was right or wrong or whether the events in question actually happened, but rather, with the understandings that the storyteller is expressing through his story. My concern was with what understanding of sustainability they wished to convey through the stories.

I applied narrative analysis techniques to interrogate the spoken word used in the digital stories. Narrative analysis 'refers to a family of approaches' in the human sciences 'to diverse kinds of texts, which have in common a storied form'. The job of the narrative researcher is to interpret the stories people tell. As the narrative analysis has to do with 'how protagonists interpret things' (Bruner, 2004) narrative analysis generally asks why the story was told that way and what the storyteller means by looking at content and context. How does the narrator tell the story? What does he or she include or exclude? Some researchers examine the narrative as a whole, whereas others break it down into component parts but regardless of the method used, to be accepted as trustworthy, the literature suggests that researchers must demonstrate that data analysis has been conducted in a precise, consistent, and exhaustive manner through recording, systematising, and disclosing the methods of analysis with enough detail to enable the reader to determine whether the process is credible.

This section will outline the method I used to interpret the spoken word in this study, so that the reader can understand the methodology used and assess the validity of the interpretations.

The following section will do the following:

- i) Introduce the basic principles of content and thematic analysis which I selected as the methodology for this part of the study
- ii) Explain how I coded and analysed the data

4.7.1 Content and Thematic Analysis of Stories

Joffe and Yardley (2004) state that content analysis is the accepted method of investigating texts, particularly in mass communications research. From their research, most content analysis results in a numerical description of features of a

given text, or series of images. Thematic analysis is similar to content analysis, but pays greater attention to the qualitative aspects of the material analysed. This section outlines the key features behind each of the two methods.

Content analysis involves establishing categories and then counting the number of instances in which they are used in a text. By quantifying the occurrence of particular categories, it enables the researcher to determine their frequency. Authors do point out that messages do not have a single meaning waiting to be revealed so the researcher analysing the data always has to make inferences, but these need to be made by systematically identifying characteristics within the text, they recommend.

Joffe and Yardley (2004) state that the content analytic method is appealing because it offers a model for systematic qualitative analysis with clear procedures for checking the quality of the analysis conducted. However, they say that often the results that are generated are sometimes accused of removing meaning from its context. Thematic analysis overcomes some of these problems Joffe and Yardley (Joffe & Yardley, 2004) say as it allows the researcher to combine analysis of the frequency of codes with an analysis of their meaning in context, thereby adding the advantages of the “subtlety and complexity of a truly qualitative analysis”. Thematic analysis involves greater interpretation from the researcher. Thematic analyses move beyond counting words or phrases and focuses on identifying and describing both implicit and explicit ideas within the data, that is, themes.

Thematic analysis has many of the same principles and procedures of content analysis with a theme referring to a specific pattern found in the data. A theme is not necessarily dependent on quantifiable measures but rather on whether it captures something important in relation to the overall research question (Braun & Clarke, 2012).

Part of the flexibility of thematic analysis is that it allows researcher judgement to determine themes in a number of ways; however, it is important that researchers are consistent in how this is done within any particular analysis according to Braun & Clarke.

"Theme" can be described as the subjective meaning message of data. Codes with common points of reference and through which ideas can be united throughout the study can be transformed into a theme. In other words, a theme is a red thread of

underlying meanings, within which similar pieces of data can be tied together and within which the researcher may answer the question "why?" or 'what'? (Erlingsson & Brysiewicz, 2013).

Initial codes may begin to form main themes, and others may form subthemes. Researchers may also find codes that do not seem to belong anywhere. Braun and Clarke (Braun & Clarke, 2012) recommended the creation of a "miscellaneous" theme to temporarily house the codes that do not seem to fit into main themes.

For each individual theme, researchers need to conduct and write a detailed analysis, identifying the themes contained in each piece of text (Braun & Clarke, 2012). Braun and Clarke suggested that theme names need to be punchy and immediately give the reader a sense of what the theme is about and I aimed to apply this to my research e.g., sentences that were coded as having to do with 'finances' were then explored to find themes such as 'sustainability is good for the rabbits and furze but not for my pocket' with a subtheme of 'why is it all farmers responsibility?'.

King (King, 2004) also suggests that themes should not be considered final until all of the data have been read through and the coding scrutinised at least twice. It is important that, by the end of this phase, researchers can clearly define what the themes are and what they are not (Braun & Clarke, 2012). Once the researcher can clearly and succinctly describe each theme, they are then ready to move onto the next phase; if not, further refinement may be required (Braun & Clarke, 2012). I applied this to my research process which is outlined later in this chapter in the section on a 'six phase approach to analysis'.

King (King, 2004) argues that if researchers simply report the codes and themes that appeared in the transcripts, the results will only offer a flat descriptive account with very little depth, doing little justice to the richness of the data. Ideally, as researchers engage in the analytic process, they will progress from description, where the data have simply been organised and summarised to show patterns, to interpretation, where researchers attempt to theorise the significance of the patterns and their broader meanings and implications, in relation to literature (Braun & Clarke, 2012). Researchers can aim to build a valid argument for choosing the themes by referring back to the literature. Braun and Clarke (Braun & Clarke, 2012) suggest that researchers aim to articulate what each theme means, as well as the assumptions

that underpin it and the implications of each theme. The final analysis should create an overall story about what the different themes reveal about the topic, they say.

The patterns of meaning that Thematic Analysis allows the researcher to identify need to be important in relation to the particular topic and research question being explored. There are numerous patterns that could be identified across any dataset - the purpose of analysis is to identify those relevant to answering my particular research questions (Braun & Clarke, 2012).

Reliability is of greater concern with thematic analysis than with word-based analyses because more interpretation goes into defining the themes. Despite these few issues related to reliability, Guest et. Al. (Guest, McQueen, & Namey, 2012) state that a thematic analysis is still the most useful in capturing the complexities of meaning within a textual data set. It is also the most commonly used method of analysis in qualitative research.

4.7.2 Deductive and Inductive Coding

There is a need to create conceptual tools for content and thematic analysis in order to classify the data and this is done by way of coding. Coding is a widely accepted term for categorising data i.e., text and labelling it as belonging to certain categories, in a way that allows for an analysis of the data.

What was coded depended on the purpose of my study and the codes needed to flow from the specific questions I sought to answer. The total set of codes comprises the coding frame, a term used interchangeably with 'coding manual' or 'coding book'.

Coding in content and thematic analytic research is time-consuming because there are no standardised categories and these need to be created by the researcher. I coded the data so as to answer the research question, and the coding frame was developed in a manner that supported this. Coding involves finding patterns in the data and in order to do this, the patterns are labelled with codes.

An inductive approach to data coding and analysis is a 'bottom up' approach, and is driven by what is in the data. What this means is that the codes and themes derive from the content of the data themselves – so that what is 'mapped' by the researcher during analysis closely matches the content of the data. In contrast, a deductive

approach to data coding and analysis is a 'top down' approach, where the researcher brings to the data a series of concepts, ideas, or topics that they use to code and interpret the data.

In reality, Braun & Clarke (2012) point out that coding and analysis often use a combination of both. It is impossible to be purely inductive, they say, as we always bring something to the data when we analyse it, and we rarely completely ignore the data themselves when we code for a particular theoretical construct – at the very least, we have to know whether or not it's worth coding the data for that construct. However, one tends to predominate they say, and a commitment to an inductive or deductive approach also signals an overall orientation which either prioritises participant- or data-based meaning, or which prioritises researcher- or theory-based meaning.

Inductive analysis is a process of coding the data without trying to fit it into a pre-existing coding frame or the researcher's analytic preconceptions. In this sense, this form of analysis is data-driven (Braun & Clarke, 2012). In contrast, deductive analysis is driven by the researchers' theoretical or analytic interest and may provide a more detailed analysis of some aspect of the data but tends to produce a less rich description of the overall data (Braun & Clarke, 2012). Researchers need to distinguish if they are conducting an inductive or deductive analysis as it will inform how the codes and themes are theorised.

The approach I chose to thematic coding was both inductive and iterative. In other words, I allowed the theory to emerge from the data, rather than beginning with a pre-existing set of theoretical propositions. I did not want to choose a theoretical construct but, instead, build one from the data. Therefore, although my insights were 'grounded' in theory I did not test any predetermined set of hypotheses about what I would find. As I focused on specific content, I began a list of relatively concrete, descriptive categories.

I made an early decision regarding what the unit of coding would be, i.e., whether codes were to be attached to each line of text or sentence. I decided in the case of the digital stories to take each segment of the spoken text as a unit of analysis. Another issue that needed to be decided was whether each coding unit should be coded exclusively into just one category, or could be coded into multiple categories.

This decision was made acknowledging the fact that the larger the coding unit, the more likely it is that it will contain material that could be coded into more than one category. From my research into methodologies, I noted that for some quantitative analyses of codes the codes must be exclusive, since statistical analysis of the relationship between codes will assume this e.g., it is not possible to calculate the correlation between two codes if they are not independent -- in other words, if a single text segment can be assigned both codes. Joffe and Yardly (2004) point out that exclusive coding has the advantage that it forces the researcher to develop very clearly defined coding categories, and this can enhance the development of the theoretical basis for these coding decisions. From the review of the literature, this was the approach that I decided to take in this research study.

Once the codes were developed, I needed to determine the reliability with which the codes could be applied. I gained an impression of the reliability by applying the codes to the same piece of text on two occasions separated by a week or so (a kind of 'test-retest' reliability).

Although, it is important to search for the multiple meanings embedded in a story, the literature informed me that the researcher must also realise that he or she cannot extract all possible interpretations. My criterion for inclusion was whether it was central to understanding sustainability. I asked myself "am I missing something important about the meaning of sustainability if I don't include this?"

4.7.3 Manifest and Latent Analyses

The literature also focused on the use of manifest and latent analysis, both of which I decided to use in my research. The decision on the development of each analytical product depends on the researcher's aim to reach descriptive (manifest content) or interpretive (latent content) levels of analysis, and the researcher's motivation in the analytical process (Bengtsson, 2016) (Vaismoradi & Turunen, 2013).

Manifest approaches are ones that focus on explicit, objectively observable phenomena, where coder judgement is minimised and there is a direct relation between the observed data and the outcome of the approach. On the other hand, latent approaches focus on abstract or theoretical constructs which are identified

through one or more observable measures (Robson & McCartan, 2016) and in turn interpreted through coder judgement.

The manifest approach allows common features to be highlighted through, for example, frequency of statements, without having to build a significant interpretation of the data. The research highlights that this approach eliminates several sources of possible bias i.e., by reducing the influence of researcher interpretation. This was a useful approach to the digital stories. Latent approaches focus on the implied value of the data which is based on the judgement of the researcher. Cash and Snider (Cash & Snider, 2014) suggest that latent approaches fundamentally utilise higher orders of interpretation, filtering the data through several layers of judgement, and, as such, require significant underlying theory to guide their interpretation.

Latent pattern approaches consider that manifest and observable cues within data exist, and it is the meaning of these elements in relation to the underlying theory that are of interest for research. Latent approaches consider that it is the interpretation of meaning itself that is of interest (Cash & Snider, 2014).

Having reviewed the literature on available methodologies, I decided that my analysis would be inductive, manifest based (frequency-based content analysis and latent (thematic analysis). Each story is presented then in two ways:

1. With codes counted based on their frequency
2. A latent analysis i.e., an interpretation of the holistic meaning of the story.

4.7.4 A six-phase approach to story analysis

In summary, having examined the literature on relevant methodologies, I took the following six stage approach.

Phase 1: Familiarisation with the Data

The first phase of the analysis involved immersing myself in the data by viewing the digital stories created, reading and re-reading textual data, and listening to audio-recordings. The phase involved transcribing the audio interviews, transcribing the digital stories and highlighting areas of potential interest. This involved asking such initial questions as: how does this participant make sense of sustainability? What

assumptions do they make in interpreting sustainability? What kind of world view is revealed through their accounts?

Phase 2: Generating initial codes

Phase 2 of the process involved the coding of the data. As described in the previous section, codes identify and provide a label for a feature of the data that may be relevant to the research question.

The literature indicated that the researcher can code in large or small chunks with some chunks not being coded at all. As it turned out, in the digital stories, it was possible to code all of the narrative of the participants. As indicated previously, I did this by examining each sentence spoken by the participant.

The technique I used was to transcribe all of the data and then as I familiarised myself with the data, I began to build a list of codes. Once I had generated a list of codes, I kept reading the data until I had identified a code for each excerpt. In cases where certain excerpts did not fit in to an existing code, I created a new code to capture that piece of data. As I progressed, some codes merged into one overarching code, as is common in other research studies.

This stage of the process ended when I felt that I had generated enough codes to capture both the diversity and the patterns within the data.

Phase 3: Conducting Content Analysis

This phase involved reviewing the coded data to identify areas of similarity and overlap between codes and to identify any broad topics or issues around which codes clustered. I then counted the codes to examine the frequencies with which they occurred, as part of the content analysis approach as outlined previously.

During this stage, researchers advocate for the use of a 'miscellaneous' theme, which would include all the codes that don't clearly fit anywhere, but I did not have to do this with the data for my research. A large part of this is that the story-makers had already edited what they wished to say before recording their digital story and this is an advantage of digital storytelling as a methodology.

Phase 5: Reviewing & Quality Checking

The fifth phase was a recursive process whereby I checked the codes against the data. This was essentially to 'quality check' the work done. This phase allowed for reflection in terms of how the codes had been assigned and gave an opportunity to rectify errors and to start to consider themes and more latent aspects of the research.

This final re-read of all the data allowed me to determine whether the analysis meaningfully captured the entire dataset. This step allowed me to see if the most important and relevant elements of the data had been captured and the overall tone of the data had been captured, in relation to my research question.

Phase 6: Analysis

At this stage, the stories, as spoken by the research participants were interpreted and connected to the broader research questions i.e., the meaning of sustainability from a thematic perspective.

This thematic analysis was driven by the question 'so what?' i.e., What is relevant or useful here to answering my question about the meaning of sustainability?

I understood from the literature that common errors in doing this type of data analysis include providing data extracts with little or no analysis (no interpretation of the data that tells us how this is relevant to answering the research question), or simple paraphrasing or summarising data (Braun & Clarke, 2012) so I aimed to not fall into this trap in my research.

Finally, I examined what was 'not said' in the digital stories. According to Feldman et. Al. (Feldman, Skoldberg, Brown, & Horner, 2004) traditions of narrative analysis from both rhetoric and semiotics recognise that one way of creating meaning in discourse is through attention to opposites embedded in discourse. In other words, elements of the story often have meaning based on what they are implicitly contrasted with, in other words, what they are not. When a storyteller describes a situation, one way to uncover meaning is by looking closely at what he or she is implying is its opposite. Feldman et. Al. (Feldman, Skoldberg, Brown, & Horner, 2004) refers to this method as a concept from classical rhetoric called the enthymeme.

They go on to say that generally speaking, an enthymeme is an incomplete or 'careless' logical inference. Often, the missing part is the major premise, but sometimes it may also be the minor premise or even the conclusion. Storytellers, she elaborates, often have enthymemes embedded in their stories because, people often avoid stating knowledge that is either taken for granted or controversial. In my analysis, I followed this guidance and looked at not only what was contained within the stories, but also what was missing and what was the relevance of same.

4.7.5 Photo analysis

Farmers who made digital stories took a number of photo's which they used to express their story (along with the spoken narrative). These photos are considered part of the findings of this research and hence there was a need to find suitable methods in order to analyse the photographs. The following section gives a background to methodologies which are used in this regard and the selection of a method of analysis to suit the purpose of this study.

4.7.6 Background to Relevant Photo Methodologies

Farmers used a range of personal photos and a small amount of video clips and I needed to find a method for analysing these images so I turned to the literature on "Participant Generated Images" (PGI). Although digital storytelling is somewhat of nascent form of arts-based research, PGI in social science research has a long history of application across the social sciences reaching back to the 1970s. The technique gives cameras to volunteer participants who are asked to take photographs representing a particular theme or topic e.g., perhaps some aspect of their life experiences. (Balomenou & Garrod, 2016).

The resulting photographs then are analysed using a wide range of techniques. Similar to text and the spoken word, the photos can then be analysed using either qualitative techniques, such as thematic analysis, or quantitative techniques, such as frequency-based content analysis (similar to the narrative analysis from the last section).

In studies on PGI, the photographs have been used as prompts during in-depth interviews or focus groups with the participants. This, then, generates secondary

data for the researcher to analyse. With a mixed-method approach, the research findings are often corroborated through a process of triangulation.

Similar to digital storytelling, this approach is said to empower participants to express concepts and feelings that would not ordinarily be possible using verbal interview techniques (Stedman, Beckley, & Ambard, 2004).

There is a tendency for PGI research to be known by different names depending on the disciplinary context in which it is applied. These include photovoice, autophotography, visitor-employed photography (VEP), participatory photography, and several others.

The term Autophotography was one of the earliest to receive its name, with the first autophotography study being published in the early 1980s by Ziller and Lewis (Ziller & Lewis, 1981) and it was this methodology that I chose for my research study as it seemed to have similar characteristics to my research study and this is outlined in the next section.

4.7.7 Auto-photography

It is the researchers job to consider not only the content of the photographs, but how the research participant's subjectivity and identities influenced what they decided to photograph, and importantly, how to represent the auto-photographs in the research results (Feldman, Skoldberg, Brown, & Horner, 2004).

Authors often emphasise that auto-photographic data "captures" or uncovers "real" experience, provides a "more complete and complex picture" of reality, and together with other methods contributes to an analytical strategy of triangulation (e.g.,. (Guell & Ogilvie, 2013). Participatory methodologies also often utilise auto-photography methods since they seek to actively engage research participants in the production of knowledge.

Photographs can represent the photographer's own view of what is important and thus are visual rhetoric. Auto-photography is an ethnographic field research method that attempts to 'see the world through someone else's eyes'. Of course, as Thomas (Thomas, 2009) points out seeing from another person's position is a fraught process, since gaining the true perspective of someone else is impossible.

Auto-photography was first used by psychologists as a technique in personality research, which investigated participants' concepts of "self". Early studies used the question "who are you?" In these studies, photography was chosen as the medium of the research as it was felt that visual communication could circumvent some of the problems participants were experiencing in verbalising their concept of self. Other auto-photography studies have experimented with similar questions, including "what are you not?" (Jones, 2004) and "me and not me" (Noland, 2006). Other questions that have been used as prompts include "what does nature in the city mean to you?" (Wilhelm & Schneider, 2006) and "what are your surroundings, the environment and life like in your area?" (Dodman, 2003).

Auto-photography allows participants the freedom to use their actual surroundings, to pick and choose the people who are important and to decide what issues and what objects are the most salient.

In terms of the methods of analysis used, studies by Ziller and Lewis (Ziller & Lewis, 1981) tend to analyse the photographs directly (using the researchers' own interpretation), whilst others tend to use a mixed-method approach, often analysing the photographs together with an explanation written by the participant (an "auto-photographic essay"). I adopted the approach of analysing the photographs directly (without asking participants why they had chosen that particular photo) and analysed the photos along with the narrative of the story.

4.7.8 Coding and Analysis of Photos

The process I used for coding and analysing the photos was as follows. I examined the photographs and created enough categories so that each photo could be assigned to one category e.g., family, farm, activities, improvements, animals, landscapes.

I coded each picture based on what it represented. I asked "What does this picture refer to?" and allowed one category per photo. In this, I selected the category that best represented the references in the picture. I labelled the photographs to begin data analysis. Next, I grouped concepts that seem to pertain to the same subject.

Photos are produced by the research subject and reflect her or his intent or position when taking the picture. I observed the objects, spaces, or people in the pictures and considered how the farmer perceived them and why they had selected them in relation to the research question. Researchers can learn why certain scenes were captured; each photo being a type of lesson about the subject who took that particular picture (Thomas, 2009). When a person takes a picture knowing that it is for a research project, they have made a decision to represent themselves through the visual scene they frame in the camera. However, this should not be overstated, Thomas says, since many times people take for granted social situations, relationships, and spaces, so their decisions about photos may not be as conscious or as intended as the previous sentence implies.

4.8 Story-Makers and Neighbouring Farmers Comparison

This section addresses the methodology for the research which compares the story-makers with a wider group of farmers.

4.8.1 Data Collection

The same questionnaire was used for the story-makers and the wider group of farmers as follows:

1. **The Story-Makers:** as outlined in the previous section, storytellers completed the questionnaire with me when I visited them on their farm. Having done this round of the questionnaire completion in person, I believed that the questionnaire did not pose any difficulty for the farmer to complete themselves and that it could be completed without a researcher being present
2. **Wider Group of Farmers:** The same questionnaire was then typed into Survey Monkey and was also printed in hard copy. All farmers of Carbery Foods were asked to complete the questionnaire. Carbery has 1,360 farmers in total supplying milk to the company and 193 farmers responded and completed the questionnaire. This represents approximately 14% of Carbery Foods suppliers. Farmers were given the option of completing the questionnaire in hard copy or online. The four co-operatives kindly agreed to put the link to the questionnaire on their website with a descriptive piece about the study. Carbery also incentivised

completion of the questionnaire by offering a draw for 5 annual subscriptions to the Farmers Journal.

4.8.2 The Questionnaire

As per the detailed overview in the literature review, I selected social and psychological constructs) as the most relevant for my study. Appendix 4 provides the detailed questionnaire and the following sections provide further information on the statements I created for the study. I selected from two to six statements to assess each of the theory of planned behaviour's major constructs. A seven point Likert scale was employed and participants were asked to circle the number that best describes their personal opinions.

Likert are types of scales in which a statement about something is made and is then followed by a series of numbers which people can choose to show how much they agree with something. If one sums the numbers for several statements, one comes up with a score that represents the person's stance towards the subject. The following provides a detailed account of the statements used for this research.

Attitudes

Farmers were asked to rate six statements to assess their attitudes towards pro-environmental practices. Farmers were asked to rate these statements on a scale of 1-7 with 1 being how much they positively agree with the statement and 7 being how strongly they disagree with the statement. The attitudes section of the questionnaire aimed to assess the degree to which a farmer has a favourable or unfavourable attitude to the environmental practices. The questions that were asked were as follows:

- In general, implementing environmental practices is too expensive (agree/disagree)
- In general, environmental practices are very expensive but worth it in the long run (likely/unlikely)
- In making a decision to implement an environmentally friendly practice, the cost is more important than the environment (agree/disagree)

- Some environmental changes are essential regardless of money, time and bureaucracy (agree/disagree)
- For me to gain a better understanding of environmentally friendly practices on my farm is: (important/not important)
- I am interested in implementing good environmental practices because it will ultimately lead to greater opportunities for grants and other supports (agree/disagree)

Subjective Norms:

As discussed in the literature review, subjective norms relate to the perceived social pressure from important others to perform or not to perform a certain practice or behaviour. In this category, farmers were asked three questions as follows:

- The reason I am implementing environmental practices on my farm is that Carbery Foods/the Co-op thinks it's important (true/false)
- The reason that I am implementing environmental practices on my farm is because it is important to me personally (important/not important)
- I am interested in good environmental practices because there is a huge opportunity in green marketing of milk products (agree/disagree)

Perceived Behavioural Control:

Perceived Behavioural Control relates to the ease or difficulty of performing the behaviour and the degree of control felt. In this category, farmers were asked to rate two statements as follows:

- I am confident that I can adopt pro-environmental practices on my farm (agree/disagree)
- For me to change to environmentally-friendly practices on the farm is relatively easy: (extremely easy/extremely difficult)

Moral Norms

As discussed in the literature review, Moral Norms relates to the degree of moral obligation to perform the behaviour or practice and the degree of regret if the action is not performed. In this category, farmers were asked to rate four statements as follows:

- Implementing environmentally-friendly practices on my farm will help safeguard the farm for future generations (agree/disagree)
- Implementing environmentally-friendly practices on my farm will have a positive impact on nature including animals and birds (agree/disagree)
- I am implementing environmentally friendly practices on the farm because I have an emotional commitment to this farm and taking care of the environment is part of that (agree/disagree)
- I am implementing environmentally friendly practices because green production is a more sustainable approach (agree/disagree)

Group Norms

As discussed in the literature review, Group Norms relate to the perceived pressure by other farmers and groups to perform the practice and the perception of other farmers in relation to performing the behaviour. In this category, farmers were asked to rate three statements as follows:

- Good environmental practice is good for my local community (agree/disagree)
- Implementing environmentally friendly practices, sets a good example for my family (agree/disagree)
- Implementing environmentally friendly practices, sets a good example for other farmers (agree/disagree)

Self-Identity

As discussed in the literature review, Self-Identity relates to the extent to which a farmer perceives the behaviour as part of himself. In this category, farmers were asked to rate four statements as follows:

- As a farmer, I believe myself to be an environmental advocate/leader (very much/not at all)
- I feel more energised and satisfied when I know that I am doing something good for the environment (very much/not at all)
- As a farmer my main role is to produce food in an efficient way (agree/disagree)
- As a farmer my main role is to protect the environment (agree/disagree)

Social Identify

As discussed in the literature review, Social Identity relates to the degree to which the farmers see himself as part of the farming community. In this category, farmers were asked to rate five statements as follows:

- Most farmers, like me, are taking on environmental practices on their farms (agree/disagree)
- Farmers are the mainstay of rural Ireland (agree/disagree)
- Farmers are the ones most closely connected to the environment in Ireland (agree/disagree)
- Farmers understand the environment in ways that experts often fail to appreciate (agree/disagree)
- Most people who are important to me approve of my environmental practices (agree/disagree).

Perceived Efficacy

As discussed in the literature review, Perceived Efficacy relates to the positive or negative perception and the efficacy of good environmental practice. In this category, farmers were asked to rate two statements as follows:

- Implementing good environmental practice on my farm is good for the environment in my area (agree/disagree)
- Implementing environmental practices on my farm will make an important contribution to reducing climate change (agree/disagree)

Motivation to Comply

Motivation to Comply relates to the motivation to comply with good environmental practices based on external influences. In this category, farmers were asked to rate six statements as follows:

- I adopt good environmental practices because it's an important Teagasc priority (very much/ not at all)
- I adopt good environmental practices because it's an important Carbery priority (very much/ not at all)
- Cork County Council expect me to implement environmentally friendly practices (very much/ not at all)
- I feel my family and friends would be disappointed if I didn't adopt good environmental practices on my farm (very much/ not at all)
- I care what people in the local community expect me to do in relation to environmentally friendly practices on my farm (very much/ not at all)
- The threat of fines and/or being reported in the local paper motivates me to adhere to environmental regulations on my farm (very much/ not at all).

Past Behaviour

From the literature review, farmers' experiences of adopting practices in the past is an indicator of the likelihood to adopt further practices in the future. In relation to this, the following questions were asked: As a result of your involvement with the Carbery Greener Dairy Farms, which practices have you done in the last 4 years? Farmers could answer this question with a 'yes' or a 'no' or 'non-applicable' (with the list of defining practices outlined in the previous section in this chapter, being shown to the farmers).

Future Intention

Similar to past behaviour, future intention gives an indication of farmers' willingness to adopt certain practices in the future and so the following question was asked: Which of the following (which you have not done) do you intend to do within the next 18 months with answers of 'yes' 'no' or 'non applicable'.

4.8.3 Additional Questions

In addition to the social and psychological constructs, farmers were also asked the following questions to provide a background to the study:

- Age group i.e., 20-30, 30-40, 40-50, 50-60, 60+
- Level of Education i.e., Primary Secondary, Third Level, Specific Farming Courses
- Will other members of your family take over the farm after you retire?

4.8.4 Data Analysis

The purpose of this part of the research was to compare the results of the questionnaire completed by the 10 story-makers with this wider group of 193 farmers with the purpose of seeing if the results of the story analysis can be inferred to a wider cohort of farmers.

The analysis made use of Average Weightings from the use of Rating Scale Questions. A Rating Scale question, commonly known as a Likert Scale (used in

this study), allows weights to be assigned to each answer choice. Rating Scales then calculate a weighted average for each answer choice.

The results are presented in a table with the questions or statements listed down the first column, and the answer choices listed across the first row. The reader will also see the average rating for each question or statement which was asked.

The rating average is calculated as follows, where:

w = weight of answer choice

x = response count for answer choice

$$X_1W_1 + X_2W_2 + X_3W_3 \dots X_nW_n$$

Total

An example of this analysis is below, with both the percentage and the number of respondents it represents included in the scale of 1-7, a total column indicating the number of respondents who answered the question in total and the final column providing the weighted average. These tables could be downloaded from Survey Monkey once all of the data had been inputted.

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
In general, implementing environmental practices is too expensive	4.23% 8	13.23% 25	17.99% 34	20. 63 % 39	17. 99 % 34	15.34 % 29	10.58% 20	189	4.23
In general, implementing environmental practices is worth it in the long run	30.16 % 57	43.39% 82	15.34% 29	5.8 2% 11	2.1 2% 4	1.59% 3	1.59% 3	189	2.17

I performed this numerical analysis for each statement for each group and then provided a comparison between the weighted average of each group in order to examine similarities and differences.

4.9 Neighbouring Farmers Views

Farmers were asked “What needs to happen, in your opinion, for farmers to adopt environmentally-friendly practices?” and the methodology used for the collection of data and the analysis of same is covered in the following sections.

4.9.1 Data Collection

As part of the questionnaire which was circulated to all farmers of Carbery Foods (as per previous section), a qualitative question was asked of the respondents in relation to what needs to happen for farmers to adopt environmentally friendly practices. Of the 193 farmers who answered the questionnaire, 153 farmers responded to this question (40 farmers skipping this question). The question allowed a blank box for writing in (when filled out in hard copy) and a free form box (with unlimited characters) if the respondent chose to complete it online. Those questionnaires which were completed by hard copy were inputted into Survey Monkey so that all the data could be analysed together.

4.9.2 Analysis of Data Collected

The responses to the question were downloaded from Survey Monkey and printed out to review in detail. The analysis process I chose for this piece of data was similar to that used in the story analysis. This was to code the data and to count the frequencies with which certain codes occurred. Again I conducted an iterative and inductive approach where the codes were grounded in the data that I had gathered. Once I had performed a content/ quantitative analysis (in the same manner as the last section), I looked for more latent/thematic meanings in the data (in the same manner as the last section) and interpreted the meaning of the responses.

4.10 Story-Watchers Methodology

This section details the methodology which was used to show the stories to other neighbouring farmers and how their responses were gathered and analysed.

4.10.1 Selection of Story-Watchers

As the videos were made by farmers from the co-op's of Drinagh and Lisavaird, they were shown to other local farmers from these two co-operatives. Drinagh Co-operative has 580 members and Lisavaird Co-operative has 260 members and all farmers from each of these co-operatives were invited to view the stories and take part in the study. Of the 840 farmers who were invited, 55 farmers accessed the first video with numbers reducing each week. Only 12 farmers viewed all of the 10 stories.

4.10.2 Data Collection

The digital stories were sent as video links to each farmer, with one video being sent each week over a 10-week period. The sample group were able to access this link on their computer or on their mobile phone. A large number of respondents accessed the videos through their mobile device.

At the end of each video, Survey Monkey automatically appeared on their screen and asked farmers to rate a number of questions having viewed the digital story. These same statements were repeated every week at the end of each video. The statements were developed based on the literature review and were as follows: -

1. This story is about people like me
2. This story is informative about environmental good practices on farms
3. This is a personal story about the farmer who made it
4. I made an emotional connection with this story
5. This story is entertaining and enjoyable
6. This story has had a positive impact on my attitude to the environment
7. I prefer looking at this story to reading scientific data on the environment

8. I prefer to receive information on the environment from external advisers and experts.

Again, a 7 point Likert scale was used for the farmers to rate their answers with 1 being Strongly Agree and 7 being Strongly Disagree. These results were analysed in the same manner as outlined in the last section i.e., by the use of weighted averages and the results are presented in tables with an analysis of the findings.

As this study tried to investigate if the digital stories would affect farmers' adoption of environmental practices, some further questions were asked as follows:

1. What did you see in this video that you could see yourself implementing on your farm?
2. When do you see yourself implementing change? i.e., straight away, 2017, 2018, 2019
3. Please give reasons for your answer (what can you see yourself implementing on your farm? i.e., why change?)

These questions were all free form text boxes which allowed farmers to input their answers. The responses were then downloaded from Survey Monkey and these were then analysed by once more examining the content (counting) and thematic (interpretive) aspects of the data.

Only 12 farmers continued to the end of the 10 weeks and watched all 10 videos and they were asked further questions as follows:

1. Why did you watch the video's made by farmers?
2. Having looked at all the videos, what do you think was the overall message from the stories?
3. Did the videos have an impact on your own farm practices in relation to sustainability?

4. This research is trying to find ways to influence farming practices to be more sustainable. Do you think these stories are a good way to influence you and other farmers? If yes, why and if no, why not?
5. Have you any comments or recommendations?

Once again, the responses to these questions were downloaded from Survey Monkey and the method of analysis performed on this data was the same as the previous section.

4.11 Considerations For the Use of Software

As a final note in relation to the methodology employed in the analysis of the data, I did investigate the use of available software and what I gleaned from the literature in relation to this is as follows.

Over the past decades a series of computer packages or Computer Assisted Qualitative Data Analysis Systems (CAQDAS) have developed e.g., Ethnograph, Atlas ti, NUDIST, which aid content and thematic analyses. As indicated by previous sections, the central analytic task of thematic analysis, in particular, is to understand the meaning of texts. This requires researchers' minds to interpret the material and the computer is a mechanical aid in this process. Computers cannot analyse textual data in the way that they can numerical data. However, as a mechanical aid, CAQDAS does appear to allow researchers to deal with many more texts than manual analyses can. Consequently, useful comparisons between groups can be made due to the inclusion of large enough numbers of participants in each group. The researcher is also assisted to look at patterns of codes, links between codes and co-occurrences in a highly systematic fashion, since retrieval of data grouped by codes is made far easier.

CAQDAS permit retrieval of data combinations in a manner similar to literature search computer packages, typically using combination retrieval terms such as AND, OR and so on. If this process is carried out using, for example, cut-and-paste techniques (using either actual printed transcripts or a word-processing package), it is not only much more time-consuming, but literally cuts the text segment out of the (con)text, whereas the packages also allow the researcher to easily view the context of a particular coded text segment, so that the contextual meaning is not lost.

It is important to note that although computer programs may be helpful to organise and examine large amounts of data, King (2004) states that none are capable of the intellectual and conceptualising processes required to transform data, nor can they make any kind of judgment but as a mechanical aid to managing material it can certainly facilitate it. As the research project focused on stories of 10 farmers and text from 153 farmers, I believed that the data was at such a level that I could both qualitatively and quantitatively analyse the data by hand. If I were to undertake a larger study, however, I believe that the use of software could be beneficial.

4.12 Summary of Methodology Chapter

This chapter has provided a detailed explanation of the methodology used for this study. The central innovative method adopted for this study was the use of digital storytelling as a method of data collection and in so doing the traditional relationship between the 'researcher' and the 'researched' was altered.

Once the data was collected from farmers (10 stories), it was then analysed using both a content analysis and a thematic analysis of both the text and the photographs used in the digital stories. The stories were then shown to other farmers by sending video links to farmers and asking questions on their view of the stories and if they were likely to influence a change in practices on their farms in relation to sustainability.

The farmers who made the stories were compared to a wider group of farmers to examine if the results of the story analysis could be inferred to a wider group of farmers. The methodology employed for this part of the study was via a questionnaire which asked participants a number of questions across a range of social and psychological constructs.

Finally, farmers were asked what would need to happen to adopt environmentally friendly practices on their farms and this data was collected both online and in hard copy and was, once more, subjected to a narrative analysis.

CHAPTER 5: DIGITAL STORIES - STORY ANALYSIS

What does Sustainability mean to Farmers?



Source: Southern Star Newspaper

5.0 Introduction

Ten farmers participated in this section of the study and all 10 farmers produced a digital story on what sustainability means to them on their farm. This chapter provides an analysis of their stories in relation to the research question: What does sustainability mean to farmers?

As per the methodology chapter, this analysis took place on two levels i.e., on a manifest level in terms of the frequencies of codes in the data (frequency-based content analysis) and on a latent level (thematic analysis). This analysis is performed individually for each of the ten stories submitted by farmers.

After analysing each story individually, this chapter provides an overall analysis of the codes and themes across the ten stories produced. A discussion of the meaning

of sustainability in relation to the literature review provides the final part of this chapter.

5.1 Discussion on Sustainability Literature

From the literature review, we have discovered that sustainability has many different meanings and therefore provokes many different responses. There are a multitude of understandings and conceptualisations of sustainability and I have summarised these as having the contrasting and often opposite definitions as follows (please refer to chapter 3, the literature review, for a full discussion):

- a) Sustainability incorporates the three pillars of economy, environment and society
- b) Sustainability is about the triple bottom line
- c) Sustainability is about Business as Almost Usual (BAAU); it is about sustaining what we already have but trying to do it more equitably whilst not damaging the natural environment i.e., an eco-efficiency argument
- d) Sustainability is about family, continuity and connection
- e) Sustainability is about place as a source of identity, behaviours and belonging
- f) Sustainability is about human's relationship with nature and the concept of the of stewardship in the Anthropocene
- h) Sustainability is about changing the mode of agriculture from productivist to multi-functional – to embrace radical and disruptive change

Having examined the literature on sustainability, I began to analyse the farmers' stories. As discussed in the methodology section, I did not commence this exercise with a definitive list of themes but choose to allow the themes to emerge naturally from the stories, however, in doing so, I was informed by the literature review and the research studies that I had examined. The following sections will provide the reader with an analysis of the digital stories.

5.2 Overview of Codes

The data from each of the stories was coded and the frequency of the codes were counted. As outlined in the methodology chapter, this exercise took a number of

iterations until the codes could be finalised. This is presented for each story from the narrative spoken in the video and the images and video that the storyteller used.

The following table 1 provides a description of the codes used for this study:

Table 1: Description of Narrative Codes

Codes	Meaning
Context	The code 'context' is used where the storyteller is providing some background information to the viewer
Place	The code 'place' is used when the farmer is referring to 'place' e.g., his home, farm, location. Place in this context is considered important as covered in the literature review.
Family	The code 'family' is used when the storyteller refers to his family either in spoken word or in photographs used of his children, wife, parents. Family pets (e.g., dogs) are also classed under the code 'family'. This does not include other animals, like cows and sheep which are viewed as commercial stock.
Generations	The code 'generations' is applied when the storyteller refers to generations in his narrative
Programme/ Guidance	This code is used when the storyteller refers to; undertaking a programme (e.g., Carbery Greener Dairy Farms Programme); doing a project (e.g., tree planting project); getting assistance (e.g., Teagasc, Discussion groups) and guidance which came from Government (e.g., nitrates directive or ban on burning plastic). Essentially, this code is applied whenever a farmer references any of the above in his spoken narrative and in photographs.
Fear	The code 'fear' is applied when a storyteller references fear e.g., 'I was worried' or 'sustainability was a word I feared'. This code does not reference fear that prevented progress but simply where fear was present.
Financial implications	This code is applied when there is a reference in the farmer's narrative and photographs to financial implications associated with sustainability. This includes all types of financial implications as follows; cost saving from new practices, getting paid to adopt new practices, expense of some practices. So this code covers 'both sides of the coin' (where there were savings and where there were expense).
Learning	The code 'learning' is applied where a storyteller references something he learned about sustainability. (In many cases this is linked to the code above for 'programme/guidance'.

Improvements and Actions and Good practices	This code is applied when a storyteller references the following which he believes helps with sustainability; improvements he made on the farm; actions he takes on his farm; and practices he undertakes on his farm.
Measurement	The code 'measurement' is used where a storyteller speaks of some sort of measurement that has been performed on his farm which he believes helps with sustainability e.g., quantities of feed, fertilisers, soil samples, measurement of habitats etc.
Pride, achievement and appreciation	This code is applied where a storyteller expresses an emotion which relates to pride, achievement or appreciation (e.g., 'we turned poor wetland into good pasture' or 'we are lucky' or 'I was pleased')
Nature & Biodiversity	The code 'Nature and Biodiversity' is used when a storyteller refers to nature and biodiversity in his spoken narrative and his photo's. Biodiversity refers to the variety of plant and animal life in the world or in a particular habitat.
Care	The code 'care' is used when a storyteller references caring in his narrative. This could be in relation to caring for nature, caring for family, caring for land and being stewards / custodians of the land.
Climate change/ Carbon Footprint / Carbon Emissions	This code is used when storytellers directly refer to climate change, or to the carbon footprint of their farm or carbon emissions.
Competitiveness	The code 'competitiveness' is used when storytellers reference the competitiveness of their farm business as part of their story.
Overarching view of Sustainability	This code is used when storytellers are speaking of an overarching or wider view of sustainability e.g., 'economy and environment are inextricably linked' or 'reducing world poverty' or 'equity for all.'
History	The code 'history' is used when farmers refer to history in their narrative and photographs e.g., 'this land has been farmed since 1850' or photos of old historic stone buildings.
Farm Equipment, Machinery & Operations	This code is applied to photographs which show farm equipment (e.g., milking parlour); farm machinery (e.g., tractors) and operations (e.g., silage pit).
Animals	This code is used when there are photographs of cows
Profitability	This code is used when farmers speak of the profitability of their farm business.

These codes were then examined to see what themes they clustered around and a thematic analysis is presented.

5.3 Detailed Analysis of Digital Stories

The following section provides a detailed analysis of the digital stories created by farmers. This is presented in the following sections: -

1. A coding of the spoken word and images/photo's/video used by the sample group in their digital stories, displayed in charts
2. A thematic analysis of each individual story considered as a whole

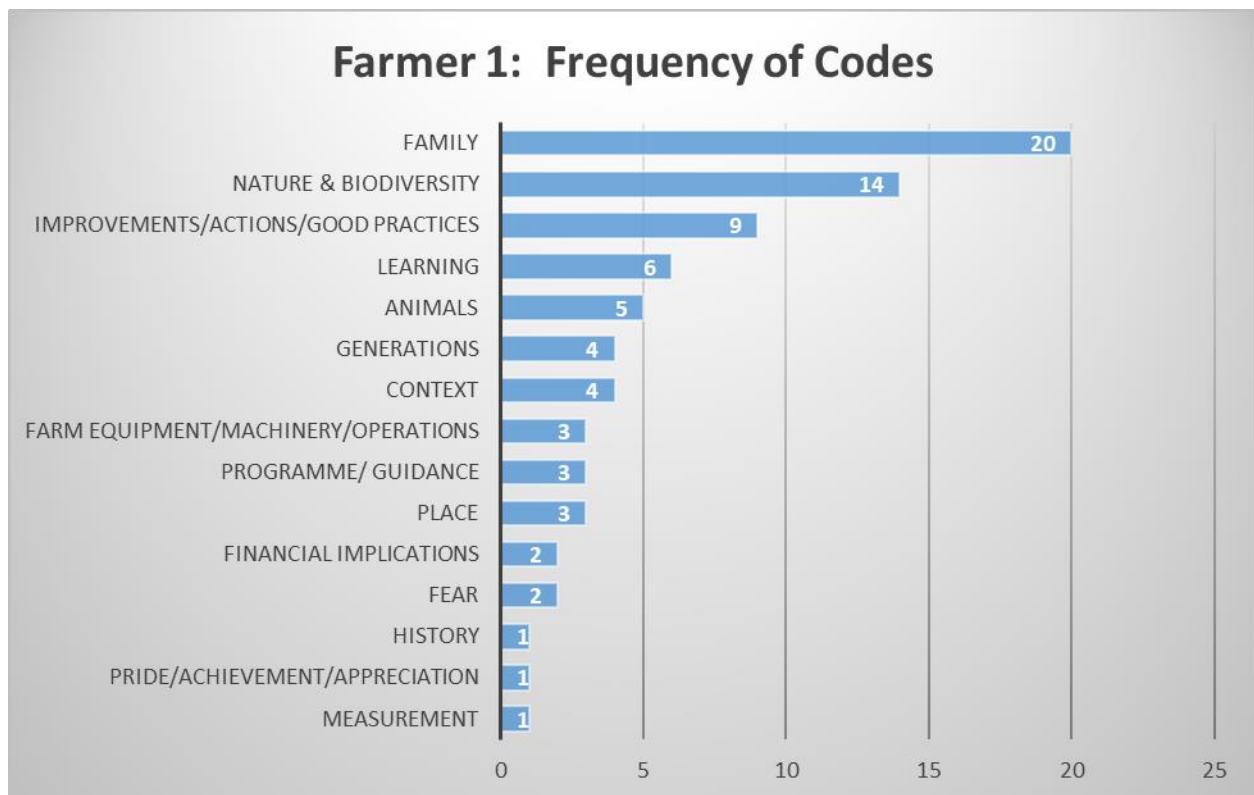
5.3.1 Michael Crowley's Story of Sustainability (Farmer 1)



Source: Carbery Foods, with Permission

The story of farmer 1 was analysed from a content frequency basis and Chart 1 provides a summary of findings. The detailed analysis of this is presented in appendix 5.

Chart 1: Meaning of Sustainability to Farmer 1



Thematic Analysis for Farmer 1

Michael Crowley was asked what sustainability meant to him on his farm. Predominantly, this story is about family and about land being passed from generation to generation. We can see from the coding that the largest portion of statements related to concepts associated with family (family = 20 references and generations = 4 references). The fact that Michael associated telling the story of sustainability so strongly with his father and particularly at an emotional time, of his father's passing, indicates that for him sustainability is strongly entrenched in the importance of family. Furthermore, it shows a level of intrinsic motivation rather than extrinsic motivation, which we know from the literature is a stronger motivational force.

There is a strong emphasis on making improvements to practices (9 references), of taking part in programmes (3 references) and learning (6 references). This was followed by references to nature and biodiversity (14 references). The importance to

the story of wild flowers was poignant as these were collected at a significant junction in Michael's life, the death of his father.

Equally, Michael mentions little about financial implications. There is one mention of guidance and one mention of the Carbery Greener Dairy Farms Programme so it is included in the story but nevertheless it does not seem to be hugely important. This story has strong associated feelings of pride and identity. Michael's identity appears strongly associated with the farm and there is an overall sense of pride in the video both in terms of what he has achieved and what his father achieved over the years in improving the farm and although the farm is in effect a business, the narrative goes much further than that in terms of what the farm means to him, most particularly in minding the land and in family. There is an element of legacy to the story where his father passed not only the farm but imparted a knowledge and a practice that he is now passing on to his children. In summary, I suggest that sustainability for Michael is about family, being a custodian of the land and the legacy that generations leave behind. These themes are echoed in the literature review particularly in relation to the discussion on caring, connectedness and continuity. Similarly, the concept of humans being stewards of the land (one of the concepts of the Anthropocene) is borne out in this story.

Michael does not mention any change in terms of changing the type of farming he is doing (large dairy) as has been covered in the literature review which indicated the radical need to change from productivist to multi-functional agriculture. In this sense, sustainability for this storyteller is about trying to farm within the existing methods of dairy production, whilst making changes to practices which would help reduce the impact on the environment such as less farm inputs etc. The tone of the story is to show a strong willingness and commitment to such endeavours. This, in the literature has been referred to as eco-efficiency or reducing unsustainability.

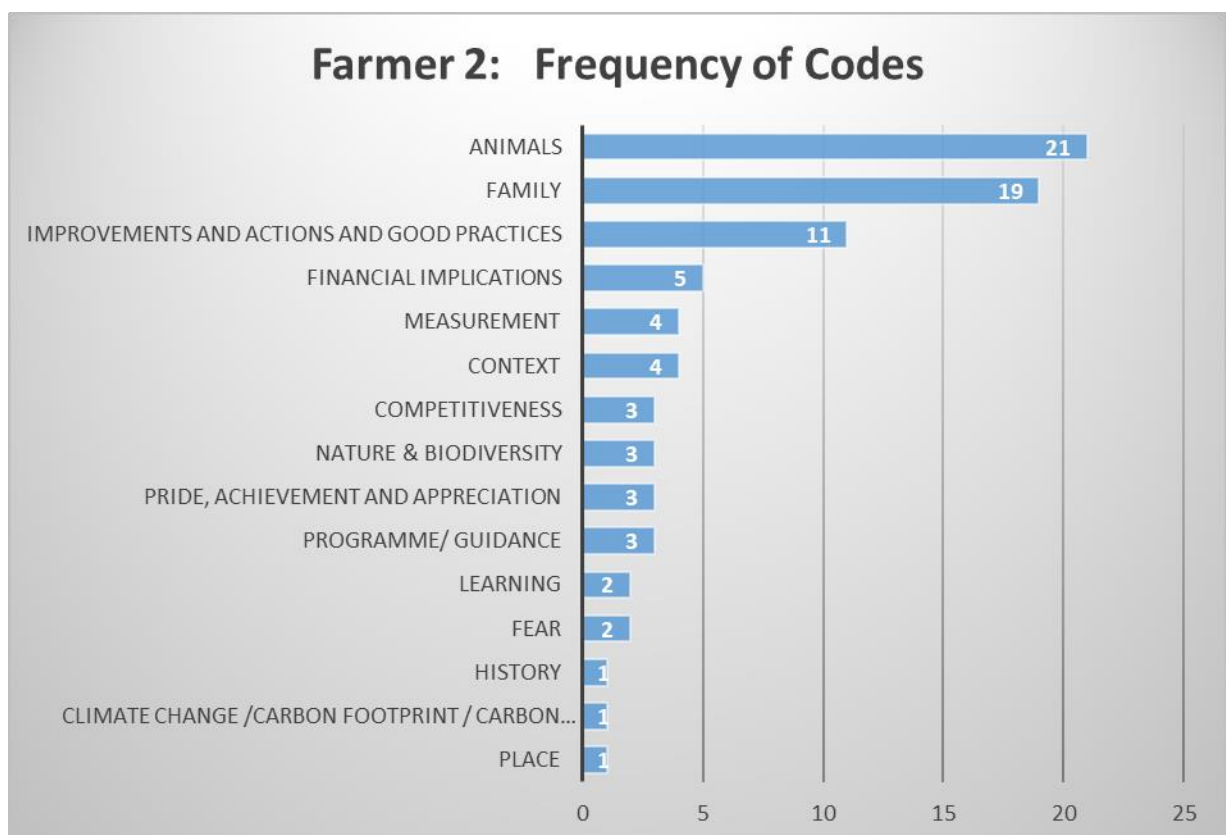
5.3.2 Aidan McCarthy's Story of Sustainability (Farmer 2)



Source: Carbery Foods, with permission

Chart 2 summarises the frequencies of codes from the story told by Aidan McCarthy. Appendix 6 provides a detailed breakdown.

Chart 2: Meaning of Sustainability to Farmer 2



Thematic Analysis of Story of Farmer 2

The results of the content analysis highlight that the largest code in this story as relating to commercial animals (21 references), this is to be expected when discussing a farm business so this may not be of significant relevance, although it does emphasise the commercial nature of his story. The next highest code is in relation to family (19 references) as the story has a large number of images of the farmer's children contained in this video and also that the story is summed up as "it is our family and our kids are what is most important and doing the right thing for the environment is doing the right thing for them".

The farmer speaks of the different improvements he has made to his farm practices (11 references) and the benefits of same in terms of farm efficiency, cost saving and benefits to the environment. The financial implications mentioned are all positive as they relate to cost saving on the farm so this story is presented as a 'win-win' between farm efficiency and taking environmentally positive actions. This would seem to connect to the construct of eco-efficiency, reducing unsustainability and benefiting financially from changing practices. The many photographs of the countryside in which the storyteller farms demonstrate a strong connection to place.

Taking part in programmes, such as the Carbery Greener Dairy Farms Programme (3 references) is seen as important to this farmer in order to learn (2 references) and measure (4 references) environmental impacts and to make positive changes to farm practices as a result of this. This is, all the while, being conscious of the competitiveness of the business (3 references). Again, the tone of the spoken narrative and the images is one of pride in the system of farming and appreciation for the place in which the storyteller farms. The farmer does express some worry and fear but the tone is one of positivity and overcoming fear ('we shouldn't be afraid'). The tone of the video shows the storyteller as having a strong commitment to learn and change practices, however, these are (similar to the last video) in terms of running the farm along the same lines but trying to improve sustainability within the current mode of farming.

In summary, the meaning of sustainability to this farmer, I suggest, is predominantly about family, being competitive and eco-efficiency.

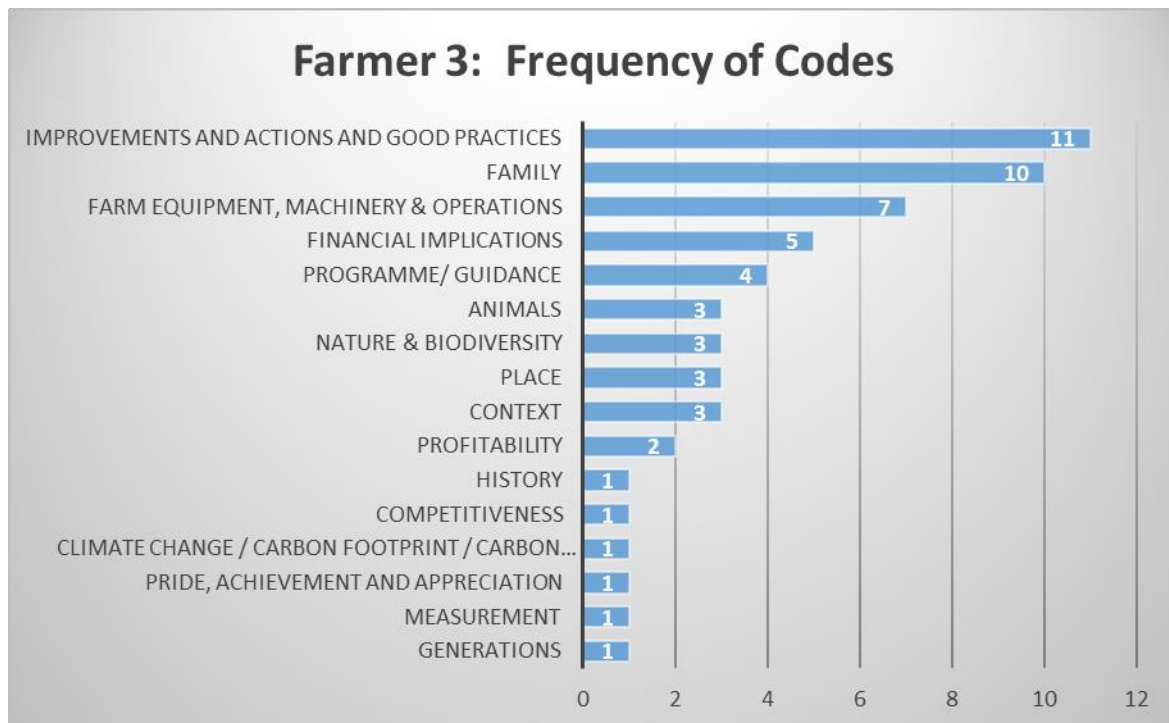
5.3.3 John Hurley's Story for Sustainability (Farmer 3): Coding



Source: Carbery Foods, With Permission

Chart 3 shows a summary of frequencies for John Hurley's story and Appendix 7 provides the reader with a detailed breakdown.

Chart 3: Meaning of Sustainability to Farmer 3



Thematic Analysis of Story of Farmer 3

This farmer focuses strongly on the improvements and good environmental practices he has undertaken on his farm (11 references). A similar amount of references is given to family and generations (family = 10 references and generations = 1 reference).

This farmer focuses more strongly, than the last two videos, on the financial implications (5 references), competitiveness (1 reference) and profitability (2 references) of the farm. There are five mentions of financial implications and once again these are all positive in terms of cost savings. The farmer also mentions taking part in programmes (4 references) which helped him to adopt good practices and to take measurements (1 reference).

The farmer has pride in 'building up' the farm and believes that profitability and sustainability can work together. As he says 'using these sustainable practices, will help us to produce good quality milk, at a low cost, be profitable and set an example for the next generation'. There is an emphasis here on the triple bottom line to include farm profitability and efficiency and environmental sustainability. The farmer goes further in terms of his reference to passing the land onto the next generation by saying that sustainable practices will set an example for the next generation, so he not only wishes to take care of the environment but teach those coming after him to take care of it also. Again, this has an element of legacy similar to other stories. This story shows a commitment to adopting certain farm practices and is discussed in a way of combining the farm business with the environment and with profitability and the operation of the farm.

It would appear that the meaning of sustainability to this farmer is about adopting good environmental practices, eco-efficiency and about family including passing the land to family and the next generation.

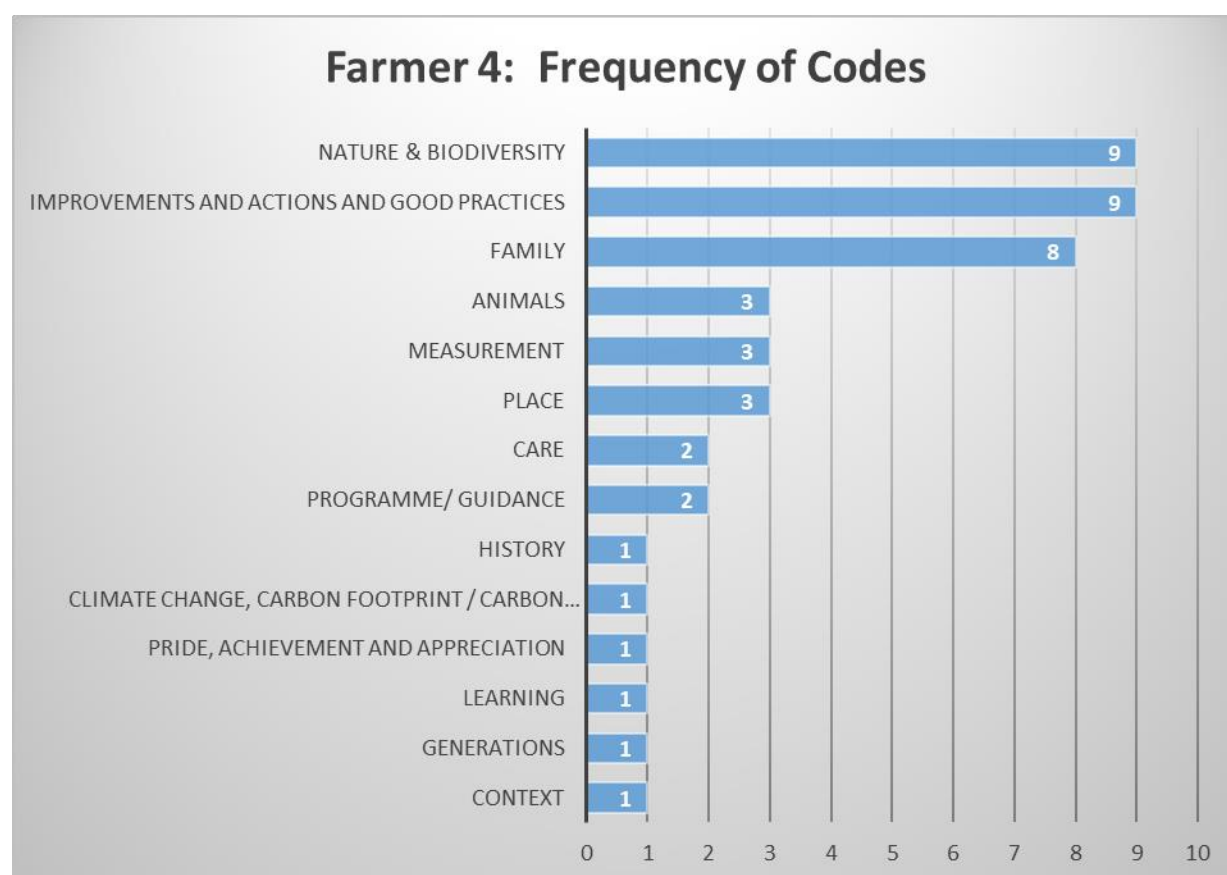
5.3.4 James Fitzpatrick Story for Sustainability (Farmer 4): Coding



Source: Carbery Foods, With Permission

Chart 4 summarises the codes for the story told by James Fitzpatrick with Appendix 8 providing the reader with a detailed breakdown.

Chart 4: Meaning of Sustainability to Farmer 4



Thematic Analysis of Story of Farmer 4

For this farmer, the meaning of sustainability is strongly about nature / biodiversity (9 references) and family / Generations (9 references). In terms of nature/biodiversity, the farmer speaks with pride about the farm being 'rich in natural trees and hedgerows' and that it has 'an abundance of wildlife' and place is also important to him with 3 references. He speaks of leaving areas of the farm available for biodiversity to flourish and that he wishes to farm 'in harmony' with nature and to leave the landscape undisturbed for the generations to come. This narrative of the 'richness' and the 'abundance' of nature and the wish to work in harmony with it relates to the literature on nature and the connectedness of the human race to same. The storyteller speaks of the purpose of taking care of biodiversity and nature as being important to passing on this land to future generations so the importance of nature is couched in the importance of family and future generations.

Of similar weight in terms of the frequencies is the reference to making improvements, taking actions and adopting certain practices (9 references). The farmer discusses learning (1 reference) from taking a programme (2 references) on good environmental practices and the importance of measurement (3 references) in these endeavours.

Interestingly, this storyteller makes no reference to financial implications, competitiveness or profitability. This does not mean that these factors are not important to the farmer, but one could speculate that when he considers the meaning of sustainability on his farm that the factors mentioned above are higher in importance to him.

In sum, this story is about making changes to farm practices in terms of eco-efficiency. It is about family, making improvements to practices and about taking care of nature/ biodiversity.

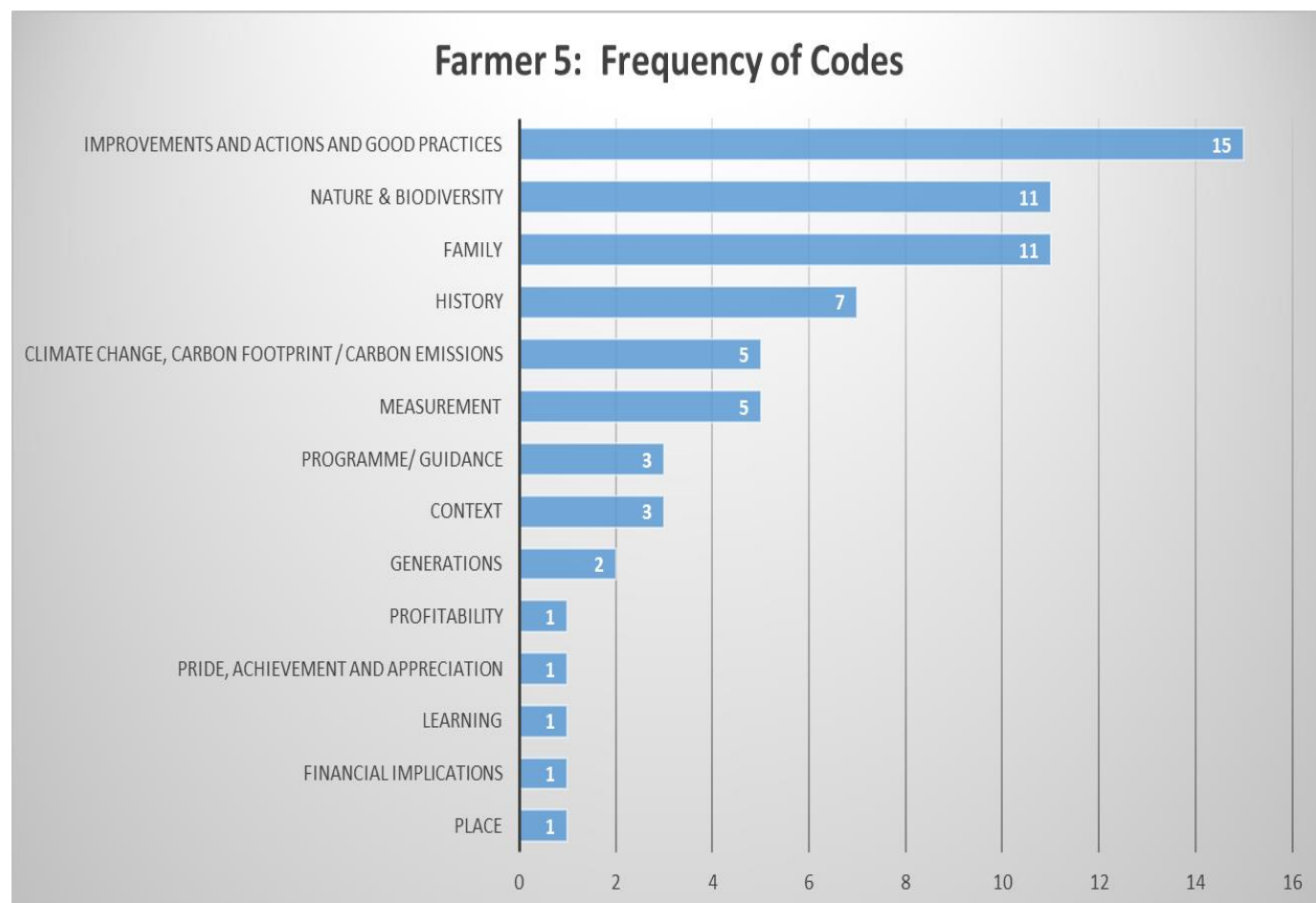
5.3.5 Cormac O’Keeffe’s Story for Sustainability (Farmer 5): Coding



Source: *The EPA.ie*

Chart 5 summarises the results of the codes for the story told by Cormac O’Keeffe with Appendix 9 providing the reader with a detailed breakdown.

Chart 5: Meaning of Sustainability to Farmer 5



Thematic Analysis of Story

The strongest emphasis in this farmer's story is in relation to improvements and actions that he has taken on his farm along with adopting good practices (15 references). These cover a range of different actions which he speaks of as 'reducing his carbon footprint' and he, in fact, references this 5 times, so we can surmise that climate change is part of what this farmer believes is important about sustainability. He speaks of climate change as being the greatest challenge for this generation.

The next most frequent reference (after actions and practices) is in relation to family (11 references) and generations (2 references) which highlights the importance of family and passing land on to the generations to come.

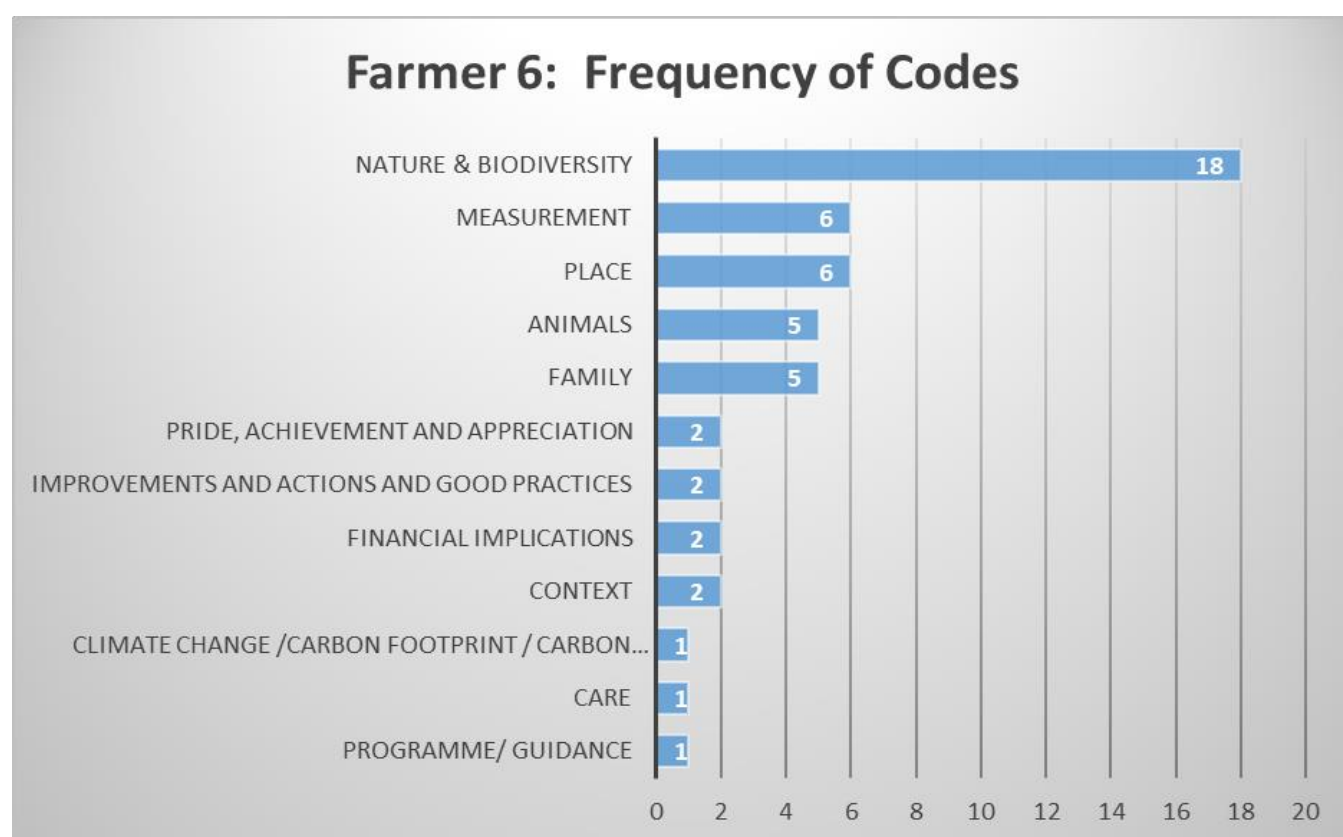
Nature and biodiversity are very important to this storyteller, when he speaks of sustainability with 11 references to nature and biodiversity in his story. He speaks of fencing off areas, which are 'natural havens' for birds, insects, flora and fauna and giving them back to nature, based on advice he received from Teagasc. But first and foremost, this farmer states that being economically sustainable is of primary importance.

Sustainability for this farmer means adopting good practices, family/ generations, nature/ biodiversity and addressing climate change. But being economically sustainable is the primary importance.

5.3.6 Tim O'Mahony's Story for Sustainability (Farmer 6): Coding

Chart 6 summarises the results for the story told by Tim O'Mahony with Appendix 10 providing a detailed breakdown.

Chart 6: Meaning of Sustainability to Farmer 6



Thematic Analysis of Story of Farmer 6

For this farmer, when discussing sustainability on his farm, nature and biodiversity are referenced the most times (18 references). The storyteller speaks of his interest in nature and the surrounding countryside and his passion for farming. He believes himself to be a 'custodian of the countryside' and the importance of place and the pride in his farm comes through strongly in this video. Place is important to this farmer with 6 references to same.

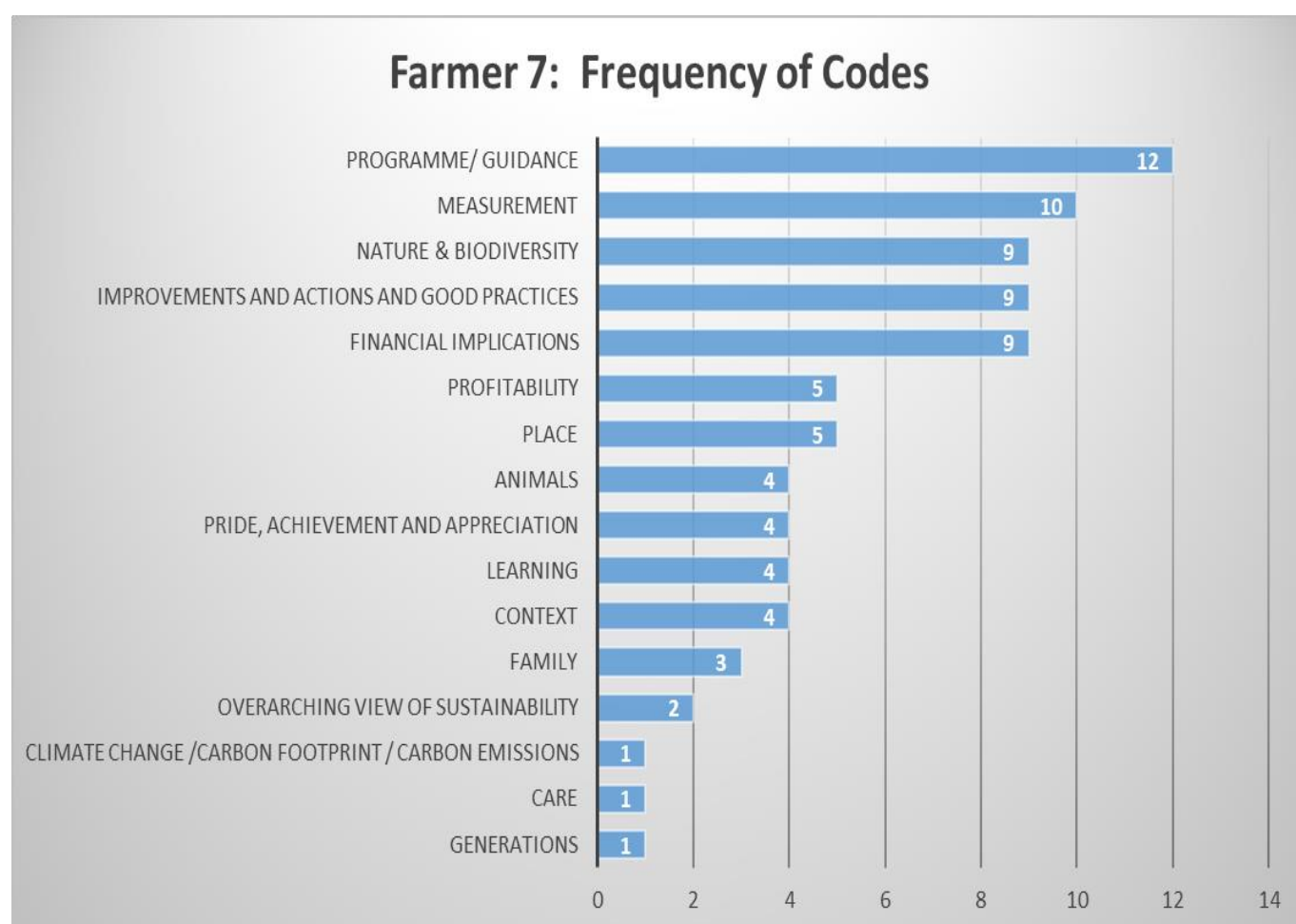
The farmer does not speak about profitability or competitiveness in this story. He makes two mentions of financial implications and these are both positive in terms of cost savings. Sustainability is strongly related to measurement for this farmer (6 references) as a way to assess various on farm factors (e.g., energy usage) and using these measurements to make on farm reductions and to reduce his carbon footprint.

For this farmer, the meaning of sustainability is in terms of taking care of nature and biodiversity and being a custodian of the land, with an emphasis on measurement and reducing impacts of unsustainability.

5.3.7 Darragh Kennedy Story for Sustainability (Farmer 7): Coding

Chart 7 provides a summary of the codes of the story told by Darragh Kennedy with Appendix 11 providing a detailed breakdown.

Chart 7: Meaning of Sustainability to Farmer 7



Thematic Analysis of Farmer 7

When discussing sustainability, this farmer places most emphasis on undertaking programmes and getting advice and guidance (12 references) and learning (4 references). In this regard, he speaks of his involvement with the Carbery Greener Dairy Farms Programme and he also refers to REPS, the nitrates directive and the ban on burning plastic, as all assisting in his story towards sustainability.

Measurement (e.g., farm inputs, soil samples) is also discussed as being of strong relevance to sustainability on his farm (10 references) and that these measurements, in conjunction with Teagasc, gave him the confidence to make changes.

Improvements to practices and actions are also discussed strongly in this story (9 references). In discussing the changes made for environmental improvements, he stresses how these have led to improved profitability (5 references) and increased financial return.

This farmer associates sustainability very strongly with financial implications (9 references) and with profitability (5 references) but while he says that economic sustainability is the first priority, he does say that environmental sustainability is also a consideration. He says that the environment and economics are not mutually exclusive and that one 'can't have one without the other'. Despite this, the storyteller emphasises the need for the farm to be profitable. Unlike other farmers, he is the farm manager (and not the farm owner) and his reference to family and generations is much less than most other stories in the research study (4 references). Despite this, the storyteller believes himself to have a duty of care towards the land and interestingly to the locality with a high reference to the code 'place' (5 references).

The storyteller also emphasises nature and biodiversity strongly in this story (9 references). Along with believing that environmental and economic sustainability are 'inextricably linked', he also puts forward a broader view of sustainability in terms of social justice and equity relating to all people having an adequate standard of living whilst preserving as much of life as possible.

Considering the themes covered in this story, the meaning of sustainability to this farmer seems very much in line with the Brundtland Commission and the three pillars of sustainability but the emphasis in this story would suggest that, of the three pillars, that profits and economics are of the highest importance.

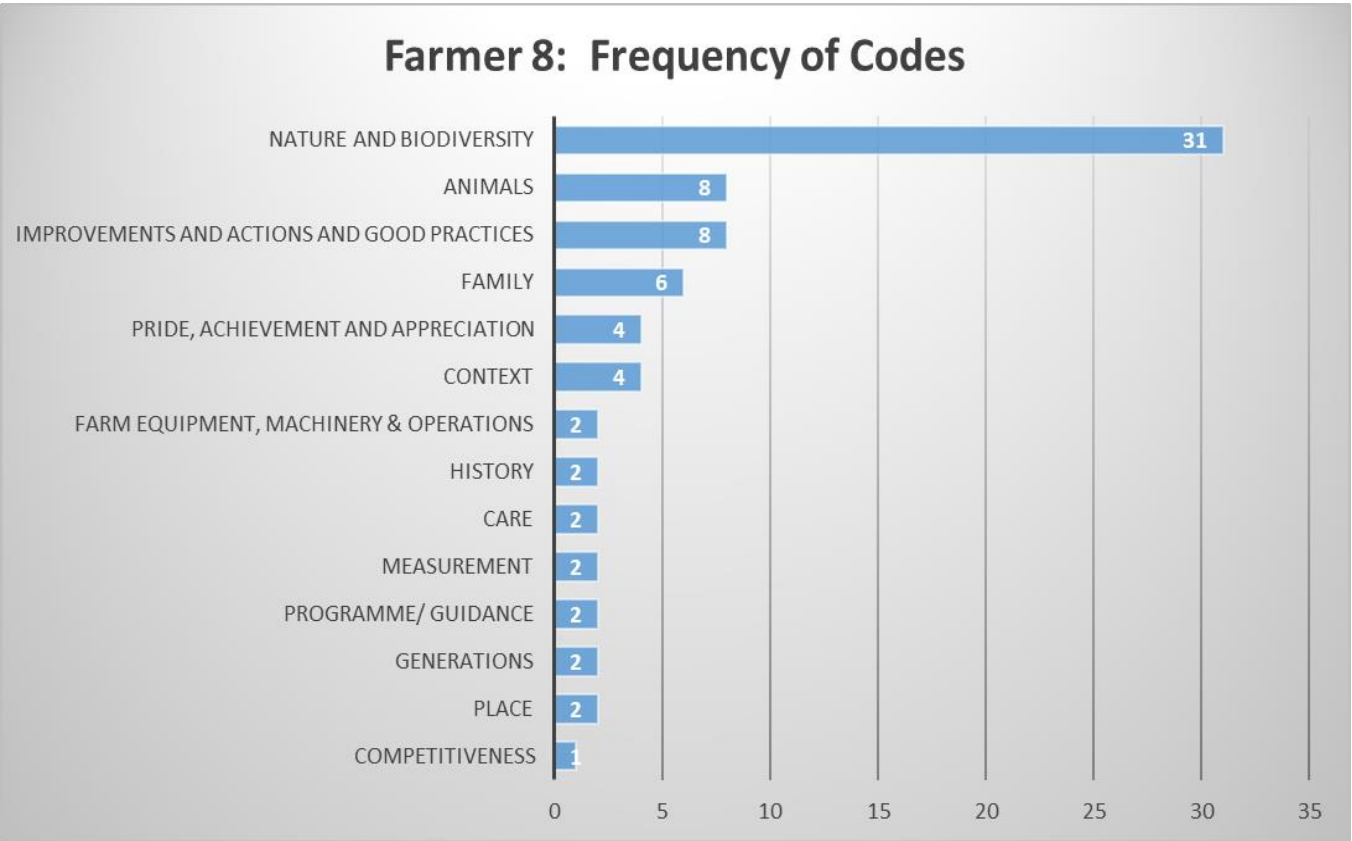
5.3.8 John Joe O’Sullivan’s Story of Sustainability (Farmer 8): Coding



Source: Carbery Foods

Chart 8 provides a summary of codes for the story told by John-Joe O’Sullivan with Appendix 12 giving the reader a detailed breakdown.

Chart 8: Meaning of Sustainability to Farmer 8



Thematic Analysis of Story

There is a strong emphasis in this story on nature and biodiversity with 31 references to same, along with this there is a further 2 references to taking care of nature. This farmer speaks of flora and fauna on his farm and devotes a large part of the video to telling the viewer about his hobby as a bee keeper and what he is trying to do to help the bees and the environment. There is a level of pride in terms of the farm (4 references) and an almost poetic turn of phrase 'I come from the land of milk and honey'. The farmer talks of his appreciation to be farming and being thankful to his parents for inheriting the farm. There is no mention of financial implications or profitability by this farmer. He does say that his aim is to produce high quality milk but he is dedicated to doing this 'without costing the earth'. Whether changes cost him financially or produce a financial reward for the farmer was not indicated within the video.

Family (6), generations (2) and history (2) were included in the video and were therefore important to sustainability for this farmer. Improvements, actions and good practices (8 references) along with measurement (2) are important also.

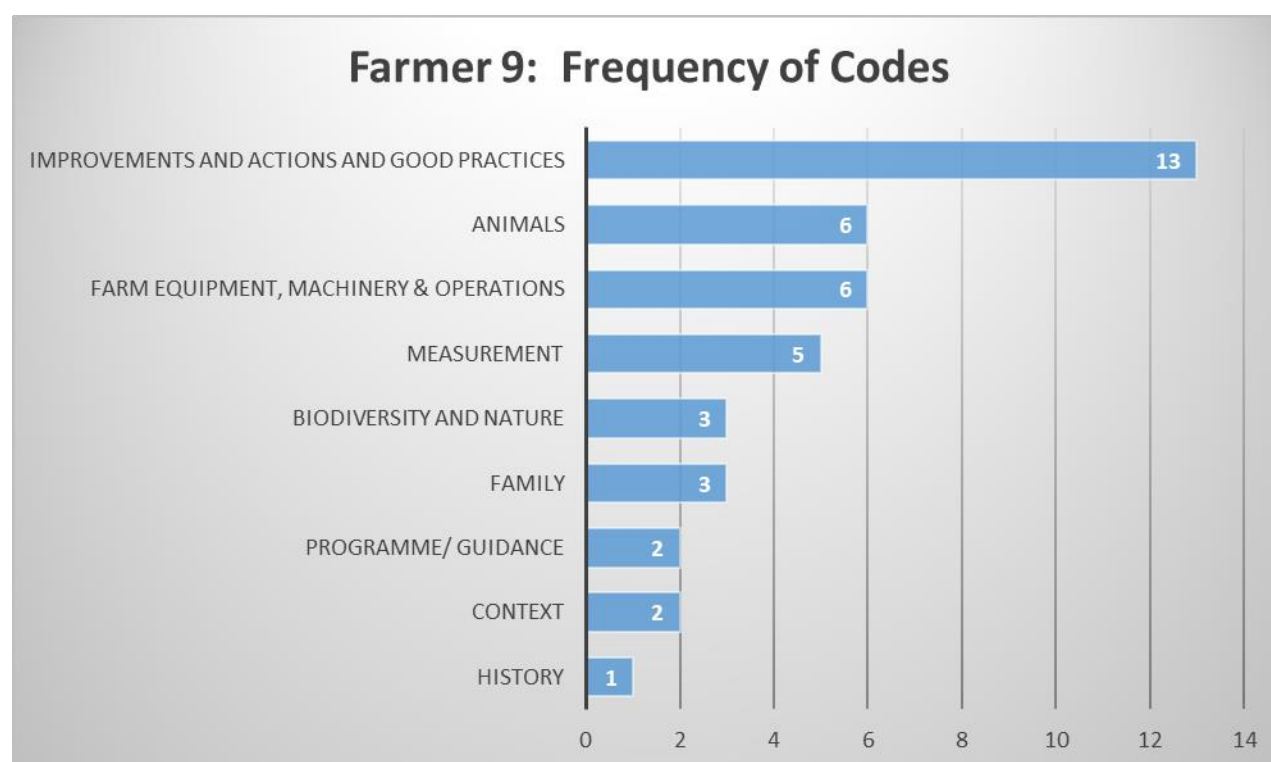
The farmer indicates that they changed from farming cattle, sheep and pigs in 1975 to farming dairy cows but this seems to be more a statement of fact rather than any particular comment on type of farming.

For this farmer, sustainability appears to be about nature and biodiversity predominantly, with also an emphasis on family and generations and adopting good practice.

5.3.9 Donal O' Connor Story for Sustainability (Farmer 9): Coding

Chart 9 provides a summary of the codes for the story told by Donal O'Connor with Appendix 13 providing a detailed breakdown.

Chart 9: Meaning of Sustainability to Farmer 9



Thematic Analysis of Story of Farmer 9

This is essentially a story about improvements that the storyteller made to his farm in relation to the use of water. Improvements and actions have the highest score in this story (at 13 references). In support of this, the farmer speaks of the Carbery Greener Dairy Farms Programme (2 references) and the benefits of measurement (5 references).

The storyteller makes some reference to family (3 references) and to biodiversity (3 references) but the story is in essence, a practical story of how water can be re-used on the farm and the benefits of same.

For this farmer, sustainability means making improvements and taking action.

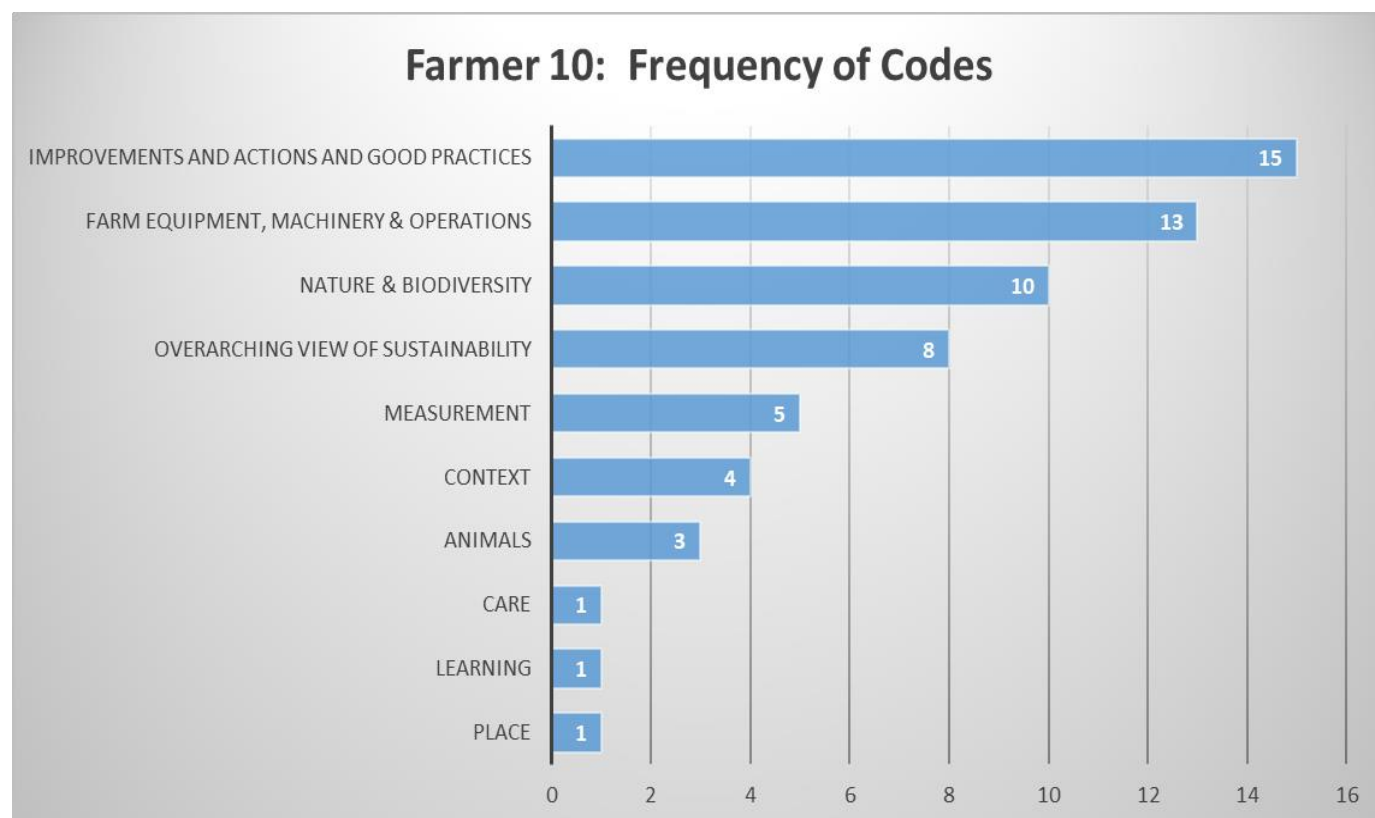
5.3.10 Sam Kingston Story of Sustainability (Farmer 10): Coding



Source: Carbery Foods, with Permission

Chart 10 give a summary of codes for Sam Kingston's story with Appendix 14 providing a detailed breakdown.

Chart 10: Meaning of Sustainability to Farmer 10



Thematic Analysis of Story:

This is the only story in the research which does not reference family or generations. Nor does it reference the Carbery Greener Dairy Programme. The emphasis of this story is on the actions and improvements that the farmer has made on his farm (15 references) along with the importance of measurement. The farmer does make one mention of being a steward of the land and has framed the improvements he made to his farm practices in this regard.

A large number of images relate to nature and biodiversity (10 references) although the storyteller does not discuss this code in the spoken word. Also, this storyteller does not discuss financial implications or profitability.

Instead, this story discusses sustainability in a wider context than the other stories in the research, who for the most part, discuss sustainability as it relates to them on a more local place basis. The storyteller discusses how resources will become finite in years to come in his view (the example he gives is of water). He also discusses sustainability in a broader and more overarching way including referring to sustainability as the 'ability to endure and succeed over time'. What is to succeed and endure is left to the understanding of the viewer. He indicates that the reason for the focus on sustainability is because global food producers and consumers want to know how their food has been farmed. This is interesting in light of the views of John Ehrenfeld in terms of businesses adopting sustainability as a corporate strategy with an emphasis on marketing.

The imagery used in this story is also interesting in terms of three interlocking circles (indicated the Brundtland definition of sustainability) or cartoon characters with melting glaciers (indicating climate change and increase in global temperatures).

In summary, the meaning of sustainability to this farmer is about measuring and making improvements and protecting against climate change.

5.4 Chapter Summary

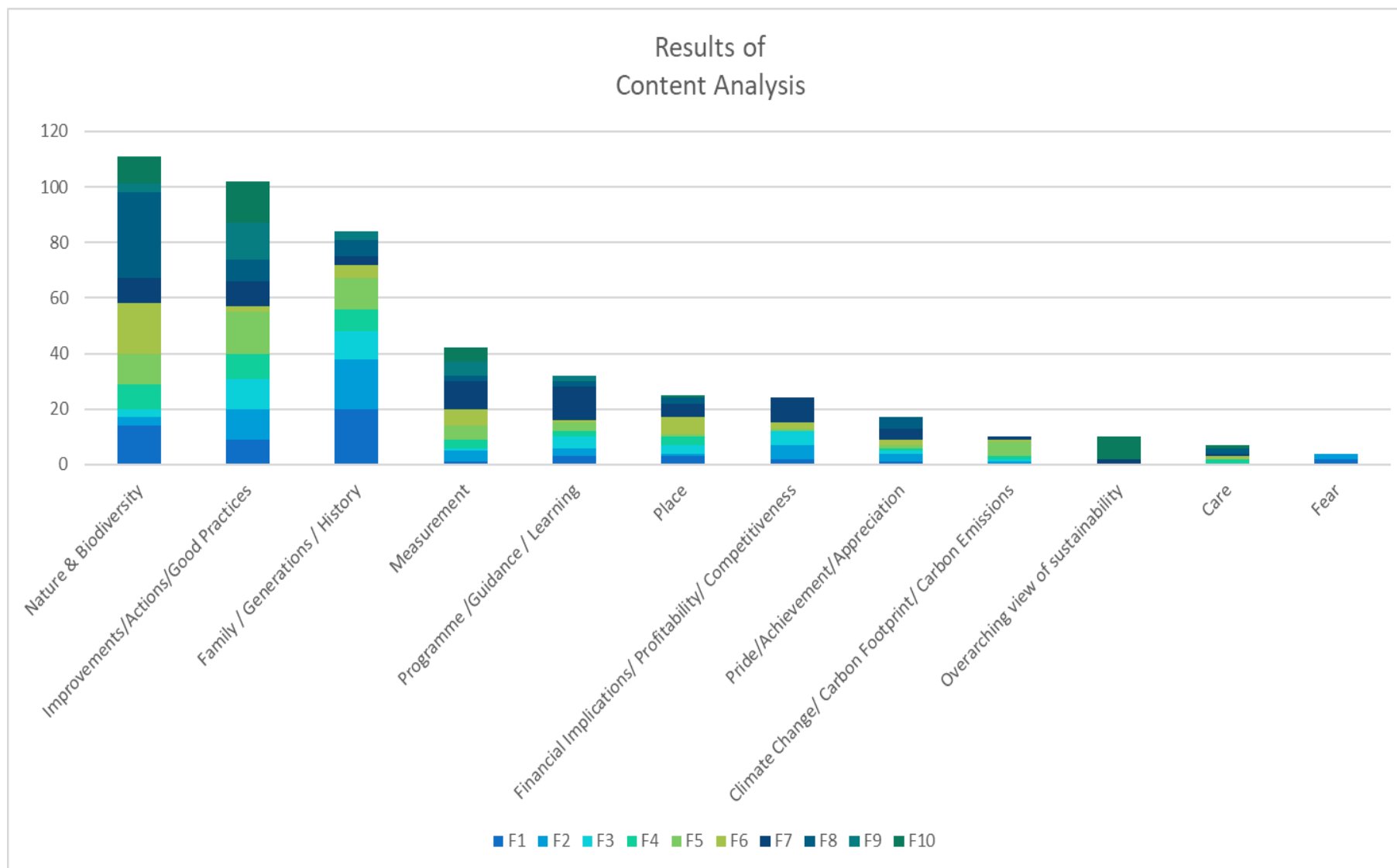
Chart 11 below provides the reader with a summary of the frequencies of codes across the 10 farmers in this research study.

The highest three codes are as follows:

1. Nature and biodiversity
2. Making improvements and good environmental practices
3. Family / generations and history

This study posed the question of ‘what does sustainability mean to farmers?’ so what has the data collected told us, particularly in relation to the themes identified from the literature review covered? These are now explored vis-à-vis the key themes which have arisen from the literature.

Chart 11: Summary of Meaning of Sustainability to Farmers



Sustainability is:

a) Taking care of this world's needs whilst not compromising the needs of the future generations

All the farmers in this study spoke to some degree about taking care of the land for future generations, often looking back at previous generations and the history contained within certain places and looking forward not only in terms of their own families but wider generations to come.

b) Sustainability incorporates economics, environment and social equity, the triple bottom line

To a lesser extent, farmers discussed farm economics in their stories, with some farmers not discussing any kind of financial implications. The focus of the stories appeared more so to focus on nature and biodiversity. Social equity was mentioned by one farmer.

c) Sustainability is about Business as Almost Usual (BAAU); it is about sustaining what we already have but trying to do it more equitably whilst not damaging the natural environment.

All the farmer stories fell into this category. All farmers concentrated on continuing their current model of farming and sustaining the current practices. The emphasis was on performing the farm practices in a way that would be better for the natural environment.

d) Sustainability is about radical change, decreasing materialism, consumerism and capitalism (and the concept of flourishing)

For the farmers in this group, sustainability is not about radical change, it is about continuing with current agricultural practices and making changes within this. There is not any emphasis on the farming model (as discussed in the literature) but a strong focus on economics in this regard in terms of marketing their milk, producing high quality milk products and being competitive. The concept of flourishing (as defined by John Ehrenfeld) as the importance of spirituality, caring and connectedness does come across in many of the stories in terms of a deep connection with nature and expressing care. Family is one of the major core themes of the stories and this has been covered also in the literature review.

e) Sustainability is about human's relationship with nature and the concept of stewardship as expressed in the Anthropocene

The literature review discussed the concept of the Anthropocene and the entanglement of the human race with nature, as no longer being separate entities. The stories, most certainly, have a strong emphasis on nature. One of the core concepts of the Anthropocene is stewardship and we have seen various references are made within the stories to being stewards of the countryside and being custodians of the land.

f) The Importance of Place

The literature review found that place is important when discussing sustainability. This is also borne out by the farmer stories in this study where not only are there numerous mentions of place but the stories point to an underlying deep connection to place. The literature review tells us that individuals often find sustainability too overarching a concept that is essentially 'happening somewhere else'. This focus on place is important from this respect as sustainability is put into a local context.

As a final comment, there are a number of themes which did not appear to emerge strongly in the literature but which do in the stories that farmers told and these are in relation to 'legacy' and 'pride'. Both legacy in terms of what farmers impart after they have passed comes across strongly in many of the stories and having pride in what they do in this life and how they develop and make changes is also imparted by the digital stories.

CHAPTER 6:

COMPARISON OF STORY-MAKERS TO WIDER GROUP OF FARMERS

6.0 Introduction

This chapter provides a comparison of the ten story-makers with the wider cohort of farmers. The chapter uses a range of psychological and social constructs as outlined in the literature review chapter and the methodology section. The questionnaire can be found in appendix 4 and has been specifically created for this purpose.

The purpose of this chapter is to compare the story-maker group (10 farmers) with a wider cohort of neighbouring farmers. From this, the intention is to see if the results of the story-analysis can be inferred to a wider group of farmers based on psychological and social constructs.

The four co-operatives who supply to Carbery Foods have approximately the following number of suppliers: -

Drinagh Co-operative: 580 farmers

Lisavaird Co-operative: 260 farmers

Bandon Co-operative: 260 farmers

Barryroe Co-operative: 260 farmers

All of these farmers were asked to take part in the survey and of the 1,360 farmers contacted, 193 farmers responded. This represents approximately 14% of Carbery Foods suppliers. In this section, we compare the results of the questionnaire completed by the 10 story-makers with this wider group of 193 farmers.

The analysis in this chapter makes use of Average Weightings by using Matrix/Rating Scale Questions. A **Matrix** question is a closed-ended question that

asks respondents to evaluate one or more row items using the same set of column choices.

A **Rating Scale** question, commonly known as a Likert Scale (used in this study), is a variation of the Matrix question where you can assign weights to each answer choice. Rating Scales calculate a weighted average for each answer choice.

The results are presented in a table with the questions or statements listed down the first column, and the answer choices listed across the first row. The reader will also see the average rating for each question or statement which was asked.

The rating average is calculated as follows, where:

w = weight of answer choice

x = response count for answer choice

$$X_1W_1 + X_2W_2 + X_3W_3 \dots X_nW_n$$

Total

6.1 Background

Before asking the questions relevant to the social and psychological constructs for this study, farmers were asked for some background information including their; age (groups were similar with the majority of farmers presenting in the 40-60 age group); level of education (groups similar also here with the majority of farmers having completed secondary education and taken some sort of short term further education in agriculture); and succession (again farmers were similar in this with the majority of farmers being unsure about what would happen to the farm on their retirement and the interest of family in taking over). Farmers were also asked what involvement in environmental programmes they had and activities they have undertaken in the last four years. The following presents the findings in relation to this and compares the results to that of the 10 story-makers.

6.2 Involvement in an Environmental Programme

The wider group of farmers were asked if they had been involved in an environmental programme and 192 farmers responded to this question, with 84 saying that they had and 108 farmers had not. The 10 story-makers had all been part of the Carbery Greener Dairy Farms Programme for the previous 2-4 years, so with less than half of the wider farming group who had undertaken an environmental programme, these results differ considerably.

6.3 Activities Undertaken in the last four years

Farmers were asked what pro-environmental activities they had undertaken in the last four years and the list of defining practices identified by Teagasc for the Carbery Greener Dairy Farms Programme was presented to farmers to respond to with a choice of: "YES" "NO" and "NOT APPLICABLE". The purpose of this question was to compare the practices adopted by the two groups of farmers in order to analyse the similarities or differences in their practices. These practices, as per the methodology chapter, were identified by Teagasc as being defining practices of good environmental farm practices. Table 2 summarises the comparison between the two groups.

Table 2: Comparison of Activities Undertaken

ACTION	10 STORY MAKERS	WIDER GROUP 193 FARMERS
Had soil fertility tests	100%	97%
Fixed water leaks	90%	99%
Spread more phosphorus	80%	59%
Installed new plate cooler	90%	38%
Installed a rain water harvesting system	10%	23%
Changed heat settings to night rate	90%	64%
Installed solar panels	10%	10%
Spread slurry on marginal land	80%	69%
Shifted to a Spring application of slurry	100%	93%
Used a trailing shoe for slurry application	50%	30%
Used the Economic Breeding index to select bulls	100%	89%
Put the cows out to grass earlier	100%	98%
Spread more urea than CAN	90%	42%
Average Score	76%	62%

In summary, story-makers show an average of having undertaken 76% of the actions listed with the wider group showing an average having undertaken 62% of the actions listed above. These results demonstrate that the wider group do have quite a positive level of pro-environmental actions. The 10 Story-Makers do show a higher percentage but one would expect this considering their involvement in the Carbery Greener Dairy Farms Programme.

6.4 Attitudes

Attitudes are the degree to which a farmer has a favourable or unfavourable attitude towards the practices in question. The detailed results are presented individually for each group in appendix 15 with the comparison shown in table 3.

Table 3: Comparison of Story-Makers and Wider Group in Relation to Attitudes

STATEMENT	10 STORY MAKERS WEIGHTED AVERAGE	WIDER GROUP 193 FARMERS WEIGHTED AVERAGE	RATING SCALE
In general, implementing environmental good practices is too expensive	4.90 Disagree	4.23 Neither agree nor disagree	1 Strongly agree 2 Agree 3 Agree somewhat 4 Neither agree nor disagree 5 Disagree somewhat 6 Disagree 7 Strongly disagree
In general, implementing environmental practices is worth it in the long run	3.70 Neither agree nor disagree	2.17 Agree	
In making a decision to implement an environmentally friendly practice, the cost is more important than the environment	4.70 Disagree somewhat	3.75 Neither agree nor disagree	
Some environmental changes are essential regardless of money, time and bureaucracy	2.00 Agree	2.26 Agree	
It is important for me to gain a better understanding of environmentally friendly practices on my farm	2.10 Agree	2.08 Agree	

I am interested in implementing good environmental practices because it will ultimately lead to greater opportunities for grants and other supports	4.90 Disagree somewhat	2.56 Agree somewhat	
Total average score Attitudes	3.71 NEITHER AGREE NOR DISAGREE	2.84 SOMEWHAT AGREE	

These results show a somewhat similar outcome in terms of attitudes with the story makers rating at 4 (3.71) and the wider group rating at 3 (2.84).

The results show a higher level of interest by the wider group of farmers in financial incentives associated with pro-environmental practices and the cost of implementing pro-environmental practices, although the wider group did feel more strongly that these actions will be worth it in the long run.

6.5 Decision-making – Who Influences Farmers’ Decisions?

As outlined in the literature review, in the context of this study, decision-making refers to subjective norms i.e., the perceived social pressure from important others to perform or not to perform the behaviour. The detailed results are presented individually for each group in appendix 16 with table 4 showing the comparison.

Table 4 below provides a comparison between the two groups in relation to decision-making.

Table 4: Comparison between Wider Group and Story-Makers in relation to Decision Making

STATEMENT	10 STORY MAKERS WEIGHTED AVERAGE	WIDER GROUP 193 FARMERS WEIGHTED AVERAGE	RATING SCALE
I would be influenced to implement environmentally good practices on my farm if Carbery Group / the co-op think it's important	5.10 Disagree somewhat	2.34 Agree	1 Strongly agree 2 Agree 3 Agree somewhat 4 Neither agree nor disagree 5 Disagree somewhat 6 Disagree 7 Strongly disagree
Implementing environmental good practice is important to me personally	1.6 Agree	2.08 Agree	
I am interested in good environmental practices because there is a huge opportunity in green marketing of milk products	2.30 Agree	1.06 Strongly agree	
Total average score Attitudes	3 Agree somewhat	5.48 Disagree somewhat	

These results show a difference in responses between the story makers rating at 3 and the wider group rating at 5 (5.48).

The wider group show a higher likelihood of being influenced by what Carbery Foods think is important in terms of environmentally friendly practices, along with a higher interest in green marketing. Both of these influencers relate to their farm business and so have a stronger focus on economics, so this shows a higher level of extrinsic motivation (i.e., motivated by outside factors). The story-makers are more motivated intrinsically i.e., they are motivated by personal reasons to behave in certain ways. The literature review tells us that Intrinsic motivation (where we want to do

something because it is important to us personally) has a higher likelihood of changing practices and behaviours.

6.6 Knowledge

This section addresses the area of knowledge that farmers have in relation to environmentally friendly practices. The detailed results are presented individually for each group in appendix 17 with the comparison in table 5.

Table 5: Comparison of Two Groups in relation to Knowledge

STATEMENT	10 STORY MAKERS WEIGHTED AVERAGE	WIDER GROUP 193 FARMERS WEIGHTED AVERAGE	RATING GUIDE
I am confident that I can adopt pro-environmental practices on my farm	1.30 Strongly agree	2.86 Agree somewhat	1 Strongly agree 2 Agree 3 Agree somewhat 4 Neither agree nor disagree 5 Disagree somewhat 6 Disagree 7 Strongly disagree
For me to change to environmentally-friendly practices on the farm relatively easily	2.20 Agree	3.01 Agree somewhat	
Total average score Knowledge	3.5 NEITHER AGREE NOR DISAGREE	2.9 AGREE SOMEWHAT	

These results show a somewhat similar outcome in terms of knowledge with the story makers rating at 4 (3.5) and the wider group rating at 3 (2.9).

The story-makers show a higher level of believing that they have the knowledge to adopt pro-environmentally practices and the ease with which they could do it. This may relate to the higher level of knowledge gained as a result of participation in the Carbery Greener Dairy Farmers programme.

6.7 Moral Norms

The detailed results are presented individually for each group in appendix 18 with the comparison in table 6.

Table 6: Comparison of the two Groups in relation to Moral Norms

STATEMENT	10 STORY MAKERS WEIGHTED AVERAGE	WIDER GROUP 193 FARMERS WEIGHTED AVERAGE	RATING GUIDE
Implementing environmentally friendly practices on my farm will help safeguard the farm for future generations	2.20 Agree	2.24 Agree	1 Strongly agree 2 Agree 3 Agree somewhat 4 Neither agree nor disagree 5 Disagree somewhat 6 Disagree 7 Strongly disagree
Implementing environmentally friendly practices on my farm will have a positive impact on nature including animals and birds	1.20 Strongly agree	2.05 Agree	
I have an emotional commitment to this farm and taking care of the environment is part of that	1.80 Agree	2.01 Agree	
I am implementing environmentally friendly practices because green production is a more sustainable approach	2.00 Agree	2.17 Agree	
Total Average Score	1.8	2.11	

These results show a similar outcome in terms of personal reasoning with the story makers rating at 2 (1.8) and the wider group rating at 2 also (2.11).

The slight variation is from a stronger emphasis being placed on nature by the story-makers along with a higher level of emotional attachment to the farm expressed and a higher belief in sustainable farming.

6.8 Community Contexts for Farmers' Decisions

The detailed results are presented individually for each group in appendix 19 with the comparison in table 7.

Table 7: Comparison of Responses in relation to Community Context

STATEMENT	10 STORY MAKERS WEIGHTED AVERAGE	WIDER GROUP 193 FARMERS WEIGHTED AVERAGE	RATING GUIDE
Good environmental practice is good for my local community	2.09 Agree	1.40 Strongly agree	1 Strongly agree 2 Agree 3 Agree somewhat 4 Neither agree nor disagree 5 Disagree somewhat 6 Disagree 7 Strongly disagree
Implementing environmentally friendly practices sets a good example for my family	1.87 Agree	1.40 Strongly agree	
Implementing environmentally friendly practices sets a good example for other farmers	2.15 Agree	1.50 Strongly agree	
Total average score	2.03 Agree	1.4 Neither agree nor disagree	

These results show a somewhat different result with story-makers rating these questions at an average of 2 (2.03) and the wider group rating them at 1 (1.4) i.e., the wider group more strongly agree with these statements than do the story-group.

On all statements, the wider group rate a higher emphasis on the impact of their decisions on the local community, their family and as an example of good practice to

other farmers. This result may tie in with the previous results showing a higher level of extrinsic motivation expressed by the wider group of farmers.

6.9 Self-Identity

The detailed results are presented individually for each group in appendix 20 with the comparison in the next section in table 8.

Table 8: Comparison of Responses in relation to Self-Identity

STATEMENT	10 STORY MAKERS WEIGHTED AVERAGE	WIDER GROUP 193 FARMERS WEIGHTED AVERAGE	RATING GUIDE
As a farmer, I believe myself to be an environmental advocate or leader	3.20 Agree somewhat	3.06 Agree somewhat	1 Strongly agree 2 Agree 3 Agree somewhat 4 Neither agree nor disagree 5 Disagree somewhat 6 Disagree 7 Strongly disagree
I feel more energised and satisfied when I know that I am doing something good for the environment	2.10 Agree	2.47 Agree	
As a farmer, my main role is to produce food in an efficient way	1.30 Strongly agree	1.78 Agree	
As a farmer, my main role is to protect the environment	2.40 Agree	2.75 Agree somewhat	
Total average score	2.25 Agree	2.5 Agree somewhat	

These results show a similar outcome in terms of motivation with the story makers rating at 2 (2.25) and the wider group rating at 3 (2.5).

6.10 Role Farmers Play in Rural Ireland (Social Identity)

The detailed results are presented individually for each group in appendix 21 with the comparison in table 9.

Table 9: Comparison between the two Groups in relation to Social Identity

STATEMENT	10 STORY MAKERS WEIGHTED AVERAGE	WIDER GROUP 193 FARMERS WEIGHTED AVERAGE	RATING GUIDE
Most farmers, like me, are taking on environmental practices on their farms	3.50 Neither agree nor disagree	3.21 Agree somewhat	1 Strongly agree 2 Agree 3 Agree somewhat 4 Neither agree nor disagree 5 Disagree somewhat 6 Disagree 7 Strongly disagree
Farmers are the mainstay of rural Ireland	1.70 Agree	1.81 Agree	
Farmers are the ones most closely connected to the environment in Ireland	1.30 Strongly agree	2.12 Agree	
Farmers understand the environment in ways that experts often fail to appreciate	2.50 Agree somewhat	2.11 Agree	
Most people who are important to me would approve of environmental practices	1.40 Strongly agree	2.02 Agree	
Total average score	2.08 Agree	2.70 Agree	

These results show a similar outcome in terms of the role farmers believe they play in rural Ireland with the story makers rating at 2 (2.08) and the wider group rating also at 3 (2.70).

The results show a higher level of agreement by farmers in relation to their connection to the environment and also their opinion of how other people (who are important to them) would approve of their practices. The latter may reasonably be because this group show a higher level of pro-environmental actions than the wider group of farmers. The former relates to farmers' connection to the environment and

this bears true in the other statements in relation to intrinsic motivation and personal reasons for performing pro-environmental practices.

6.11 Perceived Efficacy

The questions are designed to examine perceived efficacy i.e.,, farmers positive or negative perceptions and the efficacy of the practice. The detailed results are presented individually for each group in appendix 22 with the comparison Table 10.

Table 10: Comparison between the two Groups on Perceived Efficacy

STATEMENT	10 STORY MAKERS WEIGHTED AVERAGE	WIDER GROUP 193 FARMERS WEIGHTED AVERAGE	RATING GUIDE
Implementing good environmental practice on my farm would make a difference to the environment in my area	1.10	2.26	1 Strongly agree 2 Agree 3 Agree somewhat 4 Neither agree nor disagree 5 Disagree somewhat 6 Disagree 7 Strongly disagree
Implementing environmental practices on my farm would make an important contribution to reducing climate change	2.70	2.90	
Average Score	1.9 Agree	2.58 Somewhat agree	

These results show a somewhat different outcome with the story makers rating at 2 (1.9) and the wider group rating at 3 (2.58).

The results show a higher level of belief by the story-makers that their actions will make a difference to the environment in their area.

6.12 Motivation to Comply

This next section focuses on compliance. The questions are designed to assess farmers' motivation to comply i.e., the positive or negative perception and the efficacy of the practice. The detailed results are presented individually for each group in appendix 23 with the comparison presented in Table 11.

Table 11: Comparison of the two Groups in relation to Motivation to Comply

STATEMENT	10 STORY MAKERS WEIGHTED AVERAGE	WIDER GROUP 193 FARMERS WEIGHTED AVERAGE	RATING GUIDE
I would adopt good environmental practices if it is an important Teagasc priority	5.20 Disagree somewhat	3.39 Agree somewhat	1 Strongly agree 2 Agree 3 Agree somewhat 4 Neither agree nor disagree 5 Disagree somewhat 6 Disagree 7 Strongly disagree
I would adopt good environmental practices if it is an important Carbery priority	4.10 Neither agree nor disagree	2.39 Agree	
I would adopt good environmental practices is Cork County Council expected me to	2.50 Agree somewhat	3.04 Agree somewhat	
I feel my family and friends would be disappointed if I didn't adopt good environmental practices on my farm	2.10 Agree	2.62 Agree somewhat	
I care what people in the local community expect me to do in relation to environmentally friendly practices on my farm	3.00 Agree somewhat	2.67 Agree somewhat	
The threat of fines and/or being reported in the local paper motivates me to adhere to environmental regulations on my farm	3.90 Neither agree nor disagree	3.19 Agree somewhat	
Average Score	3.46 Agree somewhat	2.88 Agree somewhat	

These results show a similar outcome in terms of compliance with the story makers rating at 3 (3.46) and the wider group rating also at 3 (2.88).

The slight variation is present in the wider group of farmers showing a greater likelihood of being influenced by Teagasc and Carbery Foods and showing a higher level of concern in relation to fines or being presented in the local paper in a negative light. This result is echoed in the previous results on the wider group of farmers being influenced to a greater extent by external factors.

6.13 Summary of Comparison

This chapter has concentrated on a detailed comparison between the 10 story-makers and the wider group of farmers. The purpose in doing this is to see if we can infer the results of the stories “what does sustainability mean to you on your farm” to a wider cohort of farmers.

The following summarises the results of this comparison.

Activity: Assessing the performance of 13 pro-environmentally actions by farmers.

- Story-makers show an average of having undertaken 76% of the actions listed
- The wider group show an average of having undertaken 62% of the actions listed

As per these percentages, the wider group also demonstrate a positive level of pro-environmental actions having been undertaken on their farms. The 10 Story-Makers show a higher percentage as one would expect considering their involvement in the Carbery Greener Dairy Farms Programme.

Attitudes: The degree to which a farmer has a favourable or unfavourable attitude to pro-environmental behaviours.

These results show a somewhat similar outcome in terms of attitudes with the story makers rating at 4 (3.71) and the wider group rating at 3 (2.84). The results show a higher level of interest by the wider group of farmers in financial incentives associated with pro-environmental practices and the cost of implementing pro-

environmental practices, although the wider group did feel more strongly that these actions will be worth it in the long run.

Decision making: The decision-making section examines subjective norms i.e., the perceived social pressure from important others to perform or not to perform the behaviour.

These results show a difference between the story makers rating at 3 and the wider group rating at 5 (5.48). The wider group show a higher likelihood of being influenced by what Carbery Foods think is important in terms of environmentally friendly practices, along with a higher interest in green marketing. Both of these influencers relate to their farm business and so have a stronger focus on economics, so this shows a higher level of extrinsic motivation (i.e., motivated by outside factors). The story-makers are more motivated intrinsically i.e., they are motivated by personal reasons to behave in certain ways. Intrinsic motivation (where we want to do something because it is important to us personally) has a higher likelihood of changing practices and behaviours.

Knowledge: These questions assess the perceived behavioural control farmers have as in the perceived ease or difficulty of performing the behaviour and the degree of control felt by farmers.

These results show a somewhat similar outcome in terms of knowledge with the story makers rating at 4 (3.5) and the wider group rating at 3 (2.9).

The story-makers show a higher level of having the knowledge to be able to adopt pro-environmental practices and the ease with which they could do it. This may relate to the higher level of knowledge gained as a result of participation in the Carbery Greener Dairy Farmers programme.

Personal reasoning in Decision-Making: The questions are designed to assess farmers' moral norms i.e., the degree of moral obligation to perform the behaviour and the degree of regret if not performed.

These results show a similar outcome in terms of personal reasoning with the story makers rating at 2 (1.8) and the wider group rating at 2 also (2.11). The slight variation is from a stronger emphasis being placed on nature by the story-makers

along with a higher level of emotional attachment to the farm expressed and a higher belief in sustainable farming.

Community Context for Decision-Making: These questions assess the perceived pressure by other farmers and groups to perform the behaviour and perception of other farmers performing the behaviour.

These results show a somewhat different result with story-makers rating these questions at an average of 2 (2.03) and the wider group rating them at 1 (1.4) i.e., the wider group more strongly agree with these statements than do the story-group. On all statements, the wider group rate a higher emphasis on the impact of their decisions on the local community, their family and as an example of good practice to other farmers. This result may tie in with the previous results showing a higher level of extrinsic motivation expressed by the wider group of farmers.

Farmer Motivation: The questions focus on self-identity i.e., the extent to which the farmer perceives the behaviour as part of himself.

These results show a similar outcome in terms of motivation with the story makers rating at 2 (2.25) and the wider group rating at 3 (2.5).

Role Farmers Play in Rural Ireland: These questions assess farmers' social identity i.e., the degree to which the farmer sees himself as part of the farmers' community.

These results show a somewhat similar outcome in terms of the role farmers believe that they play in rural Ireland with the story makers rating at 2 (2.08) and the wider group rating also at 3 (2.70). The results show a higher level of agreement by story-makers in relation to their connection to the environment and also their opinion of how other people (who are important to them) would approve of their practices. The latter may reasonably be because this group show a higher level of pro-environmental actions than the wider group of farmers. The former relates to farmers' connection to the environment and this bears true in the other statements in relation to intrinsic motivation and personal reasons for performing pro-environmental practices.

Opinions on Impact of Farmers Decisions: The questions are designed to examine perceived efficacy i.e., farmers positive or negative perceptions and the efficacy of the practice.

These results show a somewhat different outcome with the story makers rating at 2 (1.9) and the wider group rating at 3 (2.58). The results show a higher level of belief by the story-makers that their actions will make a difference to the environment in their area.

Compliance: The questions are designed to assess farmers' motivation to comply i.e., the positive or negative perception and the efficacy of the practice.

These results show a similar outcome in terms of attitudes with the story makers rating at 3 (3.46) and the wider group rating also at 3 (2.88). The slight variation is present in the wider group of farmers showing a greater likelihood of being influenced by Teagasc and Carbery Foods and showing a higher level of concern in relation to fines or being presented in the local paper in a negative light. This result is echoed in the previous results on the wider group of farmers being influenced to a greater extent by external factors.

This study has used social and psychological constructs in order to assess farmers' attitudes, subjective norms, perceived behavioural control, moral norms, group norms, self-identity, social identity, perceived efficacy and motivation to comply.

This chapter provides a comparison between the 10 story-makers results and the results of the wider group. Results of this analysis show a somewhat similar profile between the two groups of farmers. Some small variations arise in the following areas: -

- The wider group show a higher level of interest in financial incentives associated with pro-environmental practices and the cost of implementing pro-environmental practices.
- The wider group show a higher likelihood of being influenced by what Carbery Foods think is important
- The wider group show a higher interest in green marketing

- The story-makers show a higher level of having the knowledge to be able to adopt pro-environmentally practices and the ease with which they could do it
- The story-makers show a higher level of concern for nature
- The story-makers show a higher level of emotional attachment to their farms.

Please note that the majority of these variations are small so these are tendencies more so than broad differences. Nonetheless, it is worth noting these variations from the story-makers to the wider group. Essentially, the wider group show a slighter higher level of concern in relation to costs and are motivated slightly more by outside factors rather than the story-makers who tend to be more intrinsically (personally) motivated. From this analysis, it appears that there is a high degree of similarity between the story-makers and the wider group of farmers in this research study.

CHAPTER 7: WHAT NEEDS TO HAPPEN FOR FARMERS TO ADOPT ENVIRONMENTALLY FRIENDLY PRACTICES

A Farmers Perspective

7.0 Introduction - Qualitative Responses from Farmers

The wider group of farmers were asked the following qualitative question: “What needs to happen, in your opinion, for farmers to adopt environmentally-friendly practices?” One hundred and fifty-three farmers responded to the question with 40 farmers skipping the question. The statements from farmers were broken down into categories as outlined in the methodology chapter with themes emerging as each statement was examined and these were as follows:

1. Money Talks (94 statements)
2. We need Information and Education (32 statements)
3. Trust Farmers / Farmers Know Best (18 statements)
4. Need to adopt Practices (15)
5. Need for schemes (9)
6. Need for Common Sense (6 statements)
7. We’re doing it already (5 statements)
8. Penalties and Regulations (5 statements)
9. Demonstration (4 statement)
10. Partnerships (3 statements)
11. It’s not our fault (2 statements)
12. Other (7 statements)

The following discusses the narratives that emerged from the statements made by farmers.

7.1 “Money Talks”

The term “Money Talks” was used by many farmers in relation to this question and this presented the highest number of statements in the analysis. This was further

broken down into 1) an expressed need for financial incentives and 2) a need for the market to provide a higher price for produce so that the additional income could be invested in the farm practices. The following sections give a flavour of the statements from farmers in this regard.

7.1.1 Need for Incentives (“It’s good for the rabbits and hedgerows but not for my pocket”)

This theme emerging from the data suggests a narrative that farmers would like to adopt environmentally friendly practices but that it is expensive to do so. The focus was on “making it worth a farmer’s while” and the need to see ‘a real return’ for their efforts including what they describe as pay-back periods and savings. Farmers believed that most farmers will look after themselves first and then the environment e.g., with one respondent commenting “Definition of sustainable: if I stop farming tomorrow, it’s sustainable for rabbits and furze but not for my 4 children. If I can’t farm to meet the efficiency the markets demand, then I am not sustainable, a strong economic rationale needs to be laid out for farmers to see the benefits”.

There were 62 statements on this theme in relation to the need for financial incentives whether by grants, tax breaks or subsidies which farmers believed would assist them to adopt environmental practices. As one farmer states “Farmers react to money ... they need to be paid to implement these practices (and paid well at the start) then reduce payments as practices are in place and easier to run. It’s all about the money”. They do not believe that these changes should cost them financially as shown by the following statement “The problem I see with all new regulations and practices is it all costs the farmer hard earned income. It’s ok to implement these regulations, they all make sense but why should the farmer pay? It effects everybody”. In essence farmers believe that at a minimum, changes would need to be inexpensive or cost-neutral in order to make changes with comments such as “Good environmental (practices) are great but the money is not always there to put such practices in place e.g., installing solar panels – environmentally friendly, cost effective over time, expensive to install”.

In summary, any extra costs in carrying out changes to farm practices need to be compensated for, farmers believed. By and large, these particular statements

deemed that these incentives should come from the government / Department of Agriculture.

Examples were given of the types of incentives and grants needed such as those expressed in the following:

- “It is not possible on most farms to implement environmentally-friendly practices which require investment as the money is needed in so many places on the farm. I feel more people would take up environmental schemes if their advisor was paid by the Department of Agriculture. Farmers won’t take on an environmental scheme if he gets paid €5,000, for example, but advisors and planners etc. take €2,000 or more off him for it. Farmers are trying to keep themselves in a job and not everyone else, if it’s at their cost”
- In relation to renewable energy, the following are examples of comments “Better bonus e.g., grants of 70% or greater for any member of society who install wind turbines, solar panels etc.” or “The cost/return on implementation of individual renewable/energy and grants to incentivise these investments” or “Farmers should be encouraged financially e.g., good payment for producing electricity, wind power, and feeding it into the national grid” or “Better government support! For example, people supplying power through, what they referred to as wind energy are not getting a fair price for their KW power compared to what they are paying for it!”.
- “Incentivise implementation linked to a sealed reward system for the maintenance of the environmentally friendly method(s) adopted. No reward for non-compliance or discontinuation of a practice that is more beneficial to the environment. If the environment benefits long term, we all have a part to play”.
- “Money talks i.e., grants. What potential saving that can be made by adopting an environmentally friendly practice i.e., solar panels and payback time. Promotional offers on different practices. A feed in tariffs for PV panels and other renewable sources of electric generation”
- “Price incentives on farm inputs such as UREA”

There is a dominant thread in the narrative that “all farmers need a better understanding of good environmental practices and its benefits, more advanced practices need to be costed and the rewards for implementing them explained fully so farmers can adopt them quicker. Essentially, there is an agreement throughout the data collected in that “Cash strapped farmers are under enough pressure”.

7.1.2 “We Need to See it in our Milk Cheque”

There were 32 statements within the data collected in relation to the price of the farmers’ produce. These farmers’ responses were around seeking what they considered to be a ‘fair price’ for their milk which would ‘equal the cost of production’ and ‘not to just break even’. As one survey participant stated “Farmers need a fair price for their produce and maybe then they would not have to farm intensively”.

While farmers said that they believed it was important to adopt environmentally-friendly practices, they expressed that “it should not come at a financial cost to the farmers as it does always”. Another respondent went on to say that “The burden should be shared by co-op’s and processors. This shouldn’t be used for another financial gain on the farmer”. Essentially, respondents believed that “Markets are more connected to supply and demand, not environment”.

Respondents recognised that perhaps making changes to milk production through ‘extra effort to care for our environment’ could ‘open new and strong markets for Carbery to sell our product’ but as one respondent stated, “we will need proof of this in the price paid to those of us who made the effort and not across the farmers, as there are some very poor and careless producers”.

Respondents go on to say that “Farmers need to be paid appropriately for their produce. This will ensure that land is not overstocked, with excessive levels of fertiliser and feed being used i.e., get paid well for producing food from grass”. Farmers point out that farming is their livelihood and express pressure for working to make profit, such as the following statement “I own and run a family farm in that the income the farm generates buys food, clothes, light and heat for my family. If farming environmentally threatens my income, can you expect me to be in favour of

it? If people want environmentally friendly farming, the price for food needs to rise in the shops and be passed back to the farmer”.

For this group of statements, the farmers believe that buyer support is essential to change practices and would allow them to get “properly paid” for what they do. For this to happen, they say that the price of milk would need to increase, with one farmer pointing out that ‘It is not possible to have big borrowings with a low milk price’. From this perspective, farmers present statements which express willingness to change but that in the current economic situation, that this change is extremely difficult. As one respondent said “Most farmers including me would happily implement strategies to improve practices on our farm if it was to help the environment and wildlife, if we got a good price for our milk but greener milk will not have a dramatic influence on milk price, supply and demand does, so if the tax payer wants greener food, let them pay for it first and have it passed directly to the farmer and not the retailers who make all the money. Farmers including me would try anything to improve farming practices if they are making a decent living first.”

Farmers recognise that perhaps it could be “a strong marketing tool to produce dairy products in a sustainable and environmentally friendly way that could lead to premium prices for our milk” and that “this should encourage dairy farmers to do it right!”. In this, farmers raise the need for increased marketing with comments such as “This is a good project to start with (the digital stories) but I think Carbery could do a lot more in this area in selling the product by marketing it better at home or abroad. We have a super story to tell so let’s tell it to all. Farmers need to know what sustainability is worth in money terms to them” or a similar statement of “Strong marketing of our unique production environment to help sell our products globally, leading to increased value for farmers”. Farmers do believe that they are already doing a great deal in terms of meeting the regulations without necessarily seeing any benefit from it with one respondent saying “We need to see more benefit at farm level as we implement upgrades – in other countries e.g., NZ and USA, they are not as compliant as us and yet they seem to get similar margins?”

In fact, farmers point out the need for ‘a just wage’ or a ‘fair wage’ with one farmer stating “farmers do not make good money for the hours they put in, in relation to other jobs”. Respondents stated that if they got more money for their milk, they

could invest it on their farm. Farmers point out that these work practices 'would be beneficial for everyone' but they need to be paid for via a return for their produce.

Not only do farmers say that the importance of environmental practices to Carbery and its clients' needs to be communicated to the farmers but specifically that the financial gain that can be achieved by improving environmental efficiencies, needs to be communicated to them.

Farmers stated that they need to understand the need to change and one respondent pointing out that "Environmentally friendly farming will put more money in farmers' pockets. It is not necessarily an extensive way of farming. Show farmers the opportunities through the Carbery Greener Dairy Programme to make more money through environmentally friendly farming practices. Show farmers through the milk cheque of values of such practices to the consumer".

Farmers said that they also need to see that any environmentally-friendly practices they implement are recognised by the processor and end user as an added value which is worth more over products that have less traceability or environmental practices.

Generally, this narrative tends to point to a dissatisfaction by farmers in relation to the current milk prices being achieved, before even considering cost implications of adopting environmental practices, which farmers believe would incur more financial cost. Comments such as "We must be properly paid for our products and not just getting the left-overs and being forced by regulation" or "a positive return needs to be made to the farmer for carrying out good environmental practices. It is not good that any return should be to the processor and retailer only" are common in this regard, which further demonstrate a group who feel that they are under pressure from regulations and who believe that they are not rewarded adequately for their work/product and an inference that other players in the market (e.g., retailers) get compensated more than they do.

7.2 'We need more Information and Education'

There were 32 statements made in relation to the need for information and education. As one respondent stated "We need more solid information on our role

and impact on the environment” or the need expressed for “Education, showing farmers how to farm successfully without costing the earth”. Statements indicated that farmers need to be made more aware of the importance of protecting the environment with knowledge that is easy to implement. Furthermore, farmers believed that there was a need for less regulation and more support. Respondents expressed a need for education and workshop groups, including training days and discussion groups on farms.

It was suggested that this education could come via a number of sources: 1) through Carbery (who could advise regarding the need and customer expectations) or 2) through Teagasc or that 3) “the education must come from within the farming community/ co-op’s as farmers are suspicious of outsiders e.g., County Council, Department of Agriculture advice” and 4) respondents pointing out that “Discussion groups need to be talking about it for themselves (not because dictated by County Council etc.)” and 5) information via the media coming from this research might help with a comment of “these digital stories will show people how easy it is to adopt even a few environmentally friendly practices on their own farms”.

The importance of learning and being influenced by young family members (children) was also seen as important.

Farmers particularly pointed to the benefits of education over regulation and penalties with comments such as: “Change can be difficult for farmers but if they are made aware of the benefits to themselves as well as to their communities of improving the environment on their farms. Positive PR and education are much more beneficial than fines etc.” or “Teach farmers rather than the Department DAFM frightening farmers into cross compliance/red tape. Farmers enjoy learning and penalising farmers does not teach us how to improve the environment”. Additionally, farmers stated their view that farmers will learn from other farmers, for example, “Education especially showing the cost-benefit. Most farmers will learn from other farmers, talking about environmental practices / rather than regulations / can bring better buy-in.”

These statements highlight that farmers need to be informed and told how practices would benefit the farm/business in the long run with one respondent saying that often “Most farmers don’t realise the harm that they are doing”.

Farmers highlight the need for “Proper explanation of the benefits” (with the underlying narrative that there is not a ‘proper’ explanation at present) and some statements that indicate that the level of advice has not been satisfactory with one farmer called it “a disaster over the years”.

Respondents highlighted the need for education to be localised saying that “One size fits all does not work, make them local to the area” and that there should be financial incentives to do the courses also.

Farmers said to “Just feed them good, honest, science-based information” and that not only should there be more assistance in learning about environmentally friendly practices but also help with funding and a suggestion of “More education on basic, simple ways of minding the environment, to start and get people on board. Get a ‘win’ and progress from there.”

This narrative indicates that farmers are trying to be environmentally friendly, but are seeking more information and education on what they need to do better, at what cost that will come, and what will be gained environmentally and financially in absolute figures. Farmers believe that this would make it easier to adopt practices and result in more efficient ways to farm.

7.3 “Trust Farmers” and “Farmers Know Best”

One particular area of commentary was in relation to the spreading of slurry with farmers believing that they should be trusted to make their own decisions on their farms. There were 18 statements made in relation to this. Statements in this regard included: “The closed period of spreading slurry and fertiliser is not fair on West Cork farmers as our climate here suits early applications of slurry and fertiliser in December/ January if weather conditions permit” or “good environmental practices should be weather related, take into account different soil types farm types”.

Farmers pointed out that “the nitrates directive can be counter-productive in relation to spreading dates etc. It’s not practical, it must be linked to actual weather conditions” and that there should be “Less calendar farming. Council and department to be more farmer friendly”.

Furthermore, farmers pointed out that “Calendar farming/slurry application deadlines are not practical, put trust back in the hands of farmers” and that “farmers know their

land and the environment they work in best. Weather 'on the day' of a job such as spreading slurry is or should be in the hands of the farmer".

Indeed, one farmer stated "Why can't we spread the slurry when the tanks are full, if weather permits? Why do Teagasc have to advise us when to do it?".

Farmers said that "Closed period of slurry spreading needs to be considered for Irish climate. Often best conditions for slurry spreading can be during closed periods. No-one wants to pollute the environment. Logically, slurry is valuable and should be spread to maximise return" and that "Dates given for spreading slurry doesn't allow for weather over a year" and that "spread slurry in Spring if ground conditions are right".

Farmers believed that the "Department should relax slurry spreading rules during closed periods as you can get dry spells during Winter sometimes. Let farmers use their common sense (we know the value of slurry and don't want to waste it!).

The narrative here would appear to be that farmers believe they should be trusted to make decisions on their own farms and to a level of discontent particularly, that this is not the case in relation to the spreading of slurry. This narrative brings forward a need for better relationships between the Council, Teagasc, the Department of Agriculture and local co-operatives and also that the majority of farmers believe that the current practices need to be decided upon locally.

Similar to this theme, was the theme of "Farmers Know Best". These types of statements relate to farmers needing encouragement to change for example "Don't lecture farmers, encourage always – farmers as a rule find it difficult to change and are always afraid their livelihood might be taken from them" and the need for others to view farmers in a positive light including suggestions of "More positive press e.g., farmers stepping up" and "Highlight the great work that farmers already do in protecting the environment. Sustainability has 3 pillars > environmental, social and economic. Why not concentrate on sustainability as a whole rather than 3 individual pillars"

Furthermore, farmers commented that "If farmers were made feel more important in their role as custodians of the countryside, I think the responsibility might spur them on to better environmental practices" and that "It has to be up to every farmer to

adopt, all down the years, Teagasc have not been right to guideline us to best farm practices. We have to keep and pass on some of the old ways of good farming, most farmers love their land and strive to keep it at its best so we need to cut out half of the red tape”.

The narrative here is that farmers wish to be viewed in more of a positive light and to embrace old ways of farming including striving to do the best on the land and of being custodians of the land.

7.4 “We need to adopt practices”

Farmers suggested pro-environmental practices and this is covered in the following list of suggestions:

1. Adhere to chemical and pesticide regulations (e.g., “Farmers to be encouraged to change their attitude and behaviour regarding the use of sprays, pesticides and other chemicals, that less is maybe better than more”)
2. Keep within stocking density guidelines and organic manure applications
3. Maintain hedgerows
4. Conserve resources and use as much green energy as possible
5. Plant trees and hedgerows where it is practical to do so
6. Change to night rate electricity
7. Install plate coolers
8. Soil testing
9. Recycle plastic on a regular basis
10. Try to keep the farm as tidy as possible
11. Use more UREA than CAN
12. Spread slurry with trailing shoe
13. Put old gravity wells to work again
14. Wood burning stoves instead of burning oil
15. Plant hedges and trees on farms as part of farmers getting their B.P.S payments

This narrative indicates that farmers believe that these are actions and practices that need to take place on their farms to be more environmentally friendly. Many of these relate to learning, training and receiving advice in making changes.

7.5 Need More Schemes

Farmers pointed out a need for more schemes in order to increase environmental practices, with some farmers making suggestions of schemes similar to REPS and other discussing recycling initiatives as outlined in the following sections.

7.5.1 Schemes like REPS

There were five statements in relation to introducing a scheme similar to REPS for environmental good practices, for example “We need more incentives like REPS to carry out environmental practices e.g., hedgerows and fencing off water wells and streams” or “A scheme similar to REPS needs to be introduced. GLAS looks good from a carbon perspective but it is only suitable for extensive enterprises. It would be better to have a scheme that prioritised the environment and carbon aspects for an intensive enterprise”.

Although one farmer stated that “I think REPS scheme in the past were insufficient. Farming and agriculture as a whole just encourage *LAZY* farming”.

7.5.2 Need for Recycling

Four farmers made some suggestions re recycling as follows:

1. “As regards friendly practices, the waste plastic is a great scheme and should be done TWICE a year – some cheap way of collecting rubbish from farms – to stop people burning!”
2. “Co-op’s in my opinion should help in recycling i.e., take back fertilisation bags in bulk. They should set up depots and collection points.”
3. “Free plastic collection or drop off points”
4. “Co-op’s and agri-merchants should be promoting more environmentally friendly practices, they should take back empty fertiliser bags, covers, pallets, silage covers etc. for recycling”.

7.6 “There is a need for Common Sense”

Six statements related to a need for common sense and that practices need to be practical, easily implemented and schemes and policies need to make sense and not to contradict each other. The underlying narrative here is that farmers believe that what has happened in relation to environmental good practice to date, has not been built on ‘common sense’.

7.7 “We are Already Doing It”

There were five statements in the data where farmers pointed out that they were already adopting good environmental practices, such as “I feel a lot of farmers are implementing environmentally friendly practices as they upgrade facilities, so it’s a gradual process with expansion” or “the more focused farmers are environmentally conscious” or “I think all farmers are implementing environmental practices already through the nitrates directive and recycling of silage / bale covers etc.”. Also, one farmer stated that he felt that the present system of inspections seems to work.

7.8 Penalties and Enforcement

Five farmers suggested that financial penalties would work including comments of “No two farmers are the same. Unfortunately, some farmers will have to be fined/punished to get them to comply with some environmental practices.

Fortunately, these are the minority” or “Stronger enforcement of general good practice on farms”. One farmer warned of the use of penalties as follows: “Teach farmers rather than the Department DAFM frightening farmers into cross compliance/red tape. Farmers enjoy learning and penalising farmers does not teach us how to improve the environment” with a further farmer commenting that “I believe in protecting the environment and have an interest in birds and wildlife in general. However, with so many **inspections**, it is difficult to get things 100% right.”

This is a mixed narrative with some farmers believing that penalties would work with others warning of the amount of inspections that already exist and ‘frightening’ farmers.

7.9 Demonstration

There were four statements in relation to the importance of demonstration and leading by example including “Show farmers that these measures are working for

other farmers” and “Lead by example i.e., electric cars for all company CEO’s, government ministers, judges etc.”.

A respondent noted that at a “Recent group meeting in College, all ditches burned off with round-up, poor example to young farmers and visiting groups” with a further respondent stating that “Others need to show example i.e., the Council won’t even cut the likes of the road. Seeds are spreading on account of this”. This narrative suggests that farmers and others should lead by example.

7.10 Partnerships

Three farmers made statements in relation to the need for partnerships and for groups to work together such as “For farmers, Teagasc and County Council to set up a group of people to work together on how all of these rules are to be worked out” or “Information on farmers’ role and impact on the environment, led by Department of Agriculture, Teagasc, Carbery and the Co-op’s” or “We need meetings to address it more in my locality and surrounding areas. We need to come up with ideas and schemes to get people interested”.

7.11 “It’s Not our Fault”

There was a narrative present in the data which highlighted that farmers feel that they are being blamed for environmental problems, with three specific statements relating to same as follows:

1. “Everyone is blaming farmers about the environment but what about the big chemical factories polluting the air? What about all the planes flying over the world and all the fuel that they use. Nothing is said about that”
2. “Flash flooding and heavy rain is a problem on farm yards. I think a big environment problem is sea side towns and villages with poor waste and sewage works. Farmers have to be on top of their job because they have to pass so many inspections”
3. ‘I understand this is being aimed at farmers. We are being screwed left, right and centre with the price we are getting for our products at the farm gate and also we have to pay over the top for the raw materials it takes to run our

farms. I would say most farmers would be happy to adopt more environmentally friendly habits but Jaysus most of us are borrowed up to our eye balls and with mostly 100 hour weeks for crap money, Jaysus what more can we do?'.

The narrative here is that farmers believe that much of the blame for environmental problems is being laid at the farmers' door and that the current price of milk and the lack of incentives does not help the situation.

7.12 Other Responses

Seven other statements have been placed in the category of "other" as follows:

1. "More research"
2. "I don't think it is any of my business what other farmers do with their land or the way that they farm, it is up to the individual"
3. "Need for farm attitude change"
4. "Need for it to become the norm"
5. "A minister for environment who knows what they are talking about (non green party)"
6. "Most farmers have pride in the visual impact of their business.
Environmentally friendly can be advertised to this"
7. "Not to mention the naïve attitude of some environmentalists".

7.13 Chapter Summary

There is a dominant thread in the narrative that all farmers need a better understanding of good environmental practices and its benefits, more advanced practices need to be costed and the rewards for implementing them explained fully so farmers can adopt them quicker. But farmers do not believe that changes should come at a cost to them as they believe that with the current price of milk and the hours that they work, that they are already not adequately rewarded.

The narrative tends to point to a dissatisfaction by farmers in relation to the current milk prices being achieved, before even considering cost implications of adopting environmental practices, which farmers believe would incur more financial cost.

The picture which emerges from the analysis is of a group who feel that they are under pressure from regulations and who believe that they are not rewarded adequately for their work/product and an inference that other players in the market (e.g., retailers) get compensated more than they do. The majority of farmers' point to the need for grants, incentives and subsidies for adopting new practices and that by and large, this should come from the Department of Agriculture. A large group of farmers believe that the adoption of practices would need to be funded by an increase in the price they receive for milk currently. They do not believe that producing a 'greener' product will result in a higher price. But some farmers do believe that with increased marketing, perhaps this could change. Farmers in this group believe that if they got an increased price for the milk, then change could certainly be possible.

A large amount of statements indicated that farmers are trying to be environmentally friendly, but that they are seeking more information and education on what they need to do better, at what cost that will come, and what will be gained environmentally and financially. Farmers believe that this would make it easier to adopt practices and result in more efficient ways to farm.

Farmers put forward a list of actions and practices that need to take place on their farms to be more environmentally friendly. This list is similar to the actions and practices covered in the survey (which had come from Teagasc).

Farmers believe they should be trusted to make decisions on their own farms and to a level of discontent particularly, that this is not the case in relation to the spreading of slurry. This narrative highlights a need for better relationships between the Council, Teagasc, the Department of Agriculture and local co-operatives and also that the current practices need to be decided upon locally. There were further specific statements in relation to different government bodies working together with the farmers and the co-operatives and for an emphasis on groups which are locally based.

Farmers pointed out a need for more schemes in order to increase environmental practices, with some farmers making suggestions of schemes similar to REPS and others discussing recycling initiatives.

There is also a narrative that emerges from the data that farmers wish to be viewed in more of a positive light and to embrace old ways of farming including striving to do the best on the land and of being custodians of the land.

Six statements relayed that there is a need for common sense and that practices need to be practical, easily implemented and schemes and policies need to make sense and not to contradict each other. The underlying narrative here is that farmers do not believe that what has happened in relation to environmental good practice to date, has not been built on 'common sense'.

Furthermore, there were five statements in the data where farmers pointed out that they were already adopting good environmental practices along with a narrative that farmers believe that much of the blame for environmental problems is being laid at the farmers' door and that the current price of milk and the lack of incentives does not help the situation.

There are mixed narratives in relation to penalties with some farmers saying this would work with others saying they wouldn't. There is also a narrative which suggests that farmers and other bodies should lead by example.

Interestingly, apart from five statements where farmers believed that they were already carrying out good environmental practices, the majority of farmers appeared willing to adopt environmental practices on the basis that they would not cost them and based on education and schemes being available to support them. The narrative, overall, is driven by economics i.e., if actions and practices do not make sense from a monetary viewpoint, they will not be adopted.

The narrative also describes a group who feel under pressure both financially and in terms of working hours and an underlying sense that they are being blamed for the situation whereas they are willing to change in the right circumstances but they can't be the ones to pay for it, as good practice essentially affects everyone, from their perspective.

CHAPTER 8: The Story-Watchers

FINDINGS: ANALYSIS OF FARMERS WHO VIEWED THE STORIES

8.0 Introduction

This chapter focuses on the communication of the digital stories to farmers and the perceived influence that it has on them. There is much evidence for the growing importance of peer-to-peer (rather than focusing on a top-down) influence to expand the use of less alienating locally based discourses and to enable public discussion. From the literature review, we have learned that the research is arguing for an approach based on a better understanding of how to approach people at an effective emotional level, for example, through exploration of bottom-up, non-expert climate perceptions rather than top-down expert understandings. From this we can glean that communication needs to consider not only how to encourage public engagement with the environmental issues but also how to make the issues appealing, interesting and meaningful to the individual. The literature indicates that the higher the personal emotional connection to the communication and the level of entertainment provided by the communication, the higher the engagement of the viewer.

This primary research engaged a group of farmers and showed them one of the digital stories each week and ascertained their feedback on same. All suppliers to the co-operatives of Drinagh and Lisavaird were contacted to ask them to take part in this part of the research. These were the same co-operatives that the story-makers supplied but these farmers had not undertaken the Carbery Greener Dairy Farms Programme.

In total, Drinagh Co-operative has 560 farmers and Lisavaird co-operative has 260 farm suppliers (820 farmers in total). The research had two parts to it as follows:

Part One: Farmers were asked to view one story per week and answer a number of questions after viewing the story.

Part Two: Having looked at all 10 stories, farmers were asked to answer some final questions on all 10 stories.

With the concepts raised by the literature review, research participants were asked to rate the following statements:

- This story is informative about good environmental practices on farms
- This is a personal story about the farmer who made it
- I made an emotional connection with this story
- This story is entertaining and enjoyable
- This story is about people like me
- I prefer looking at this story to reading scientific data on the environment
- I prefer to receive information on the environment from external advisers and experts.
- This story has had a positive impact on my attitude to the environment.

Furthermore, research participants were asked:

1. Why did you watch the video's made by farmers?
2. Having looked at all the videos, what do you think was the overall message from the stories?
3. Did the videos have an impact on your own farm practices in relation to sustainability?
4. This research is trying to find ways to influence farming practices to be more sustainable. Do you think that these stories are a good way to influence you and other farmers? If yes, why and if no, why not?
5. Have you any comments or recommendations?

As the purpose of environmental communication is not only to engage but to influence viewers to change, this thesis asked story-watchers the following questions:

- What did you see in this video, that you could see yourself implementing on your farm? This question wished to assess if the digital stories watched would have an impact on changing practices on the farm.
- When do you see yourself implementing change? This question, a follow up to the previous question, refers to the timing of the changing practices and the commitment of the respondent to making changes to their practices.

- Please give reasons for your answers? This question aimed to gather any further information in terms of their reasons for changing practices.

This chapter provides the findings of the answers to these questions.

8.1 The Process

The methodology for this part of the research was as follows. Once a farmer looked at the first video and answered the questions, he was included in the next posting of video two. Once he looked at this one and answered the questions, he was included in week 3 and so on and so forth. The following table (12) shows the number of views and completed surveys that were done each week. As can be seen from the numbers, the number of views decreased each week, mainly one can assume from farmers having very busy work schedules and an element of survey fatigue, as this went on for 10 weeks.

Table 12: Number of Views

Week	Story	Number of Views and Surveys completed on watching
1	Michael Crowley	55
2	James Fitzpatrick	31
3	John Hurley	34
4	Darragh Kennedy	29
5	Sam Kingston	25
6	Aidan McCarthy	27
7	Donal O'Connor	22
8	Cormac O'Keeffe	23
9	Tim O'Mahony	22
10	John Joe O'Sullivan	22
11	Final Survey on all 10 Video's Watched	12

In the second part of the research, once farmers had looked at all 10 video stories, they were asked to complete a final survey. Only 12 farmers stayed with the

research until the end, they looked at all 10 videos and answered the questions after each video and the final questionnaire. This research recognises that this is a very small sample but the results are included here in order to provide what the responses were by these 12 farmers, which a larger study may build on in future research.

8.2 Responses to Weekly Stories Watched

The following section provides the reader with a discussion on farmers' responses to watching the digital stories, based on questions asked in the last section. This has been summarised and the main trends highlighted in this chapter including; a summary analysis of views across the statements presented; what did farmers see themselves implementing on their farm after viewing the stories; and when did they see themselves implementing change (and the reasons for same).

For the reader, who wishes to view the detailed examination of the views of each story individually, appendix 24 provides the reader with an analysis of each.

8.3 An Analysis of Responses to Viewing the Digital Stories

The stories were viewed a total of 290 times and table 13 gives the reader the results in relation to each statement. As one can see from the table, farmers believed that the stories had a positive impact on their attitude to the environment with 74% of views strongly agreeing or agreeing with this. Furthermore, 82% of views (strongly agreeing/agreeing) felt that the stories were informative about good environmental practices on farms.

This is a positive result and there appears to be a number of reasons for this, which is echoed by the literature review. Among these, farmers identified strongly with the stories (the story is about people like me), they felt the stories were personal, they made an emotional connection to the story and that the stories were entertaining and enjoyable. Interestingly, also, the majority of farmers stated that they would prefer to look at these stories rather than reading scientific data on the environment or from receiving information from external advisors and experts. From these results, we can see that peer-to-peer, personal, emotional and visual aspects of the communication, as highlighted by the literature review are proving to positively engage farmers in the subject matter.

Table 13: Responses to Viewing the Digital Stories

Statement	Strongly Agree	Agree	Somewhat Agree	Neither Agree / Disagree	Somewhat Disagree	Disagree	Strongly Disagree
This story is about people like me	37%	43%	13%	2%	2%	1%	0%
This story is informative about environmental good practices on farms	41%	41%	15%	2%	2%	0.3%	0.3%
This is a personal story about the farmer who made it	42%	36%	17%	5%	0.3%	1%	0%
I made an emotional connection with this story	26%	33%	25%	11%	2%	3%	0%
This story is entertaining and enjoyable	29%	37%	22%	8%	2%	1%	0.3%
This story has a positive impact on my attitude to the environment	31%	43%	17%	8%	0.3%	0.7%	0%
I prefer looking at this story to reading scientific data on the environment	34%	40%	16%	6%	2%	1%	0.3%
I prefer to receive information from external advisors and experts	10%	17%	22%	31%	9%	11%	1%

8.4 When do Farmers see themselves implementing Change?

Farmers were asked when they would implement change. The question was asked to ascertain if farmers are sufficiently engaged in the communication to be influenced to change. The vast majority of farmers said they would effect change either straight away or within the following year. Table 14 provides details of when farmers believed that they would implement change. Once more, this is a positive result from the digital stories in that farmers could see themselves taking aspects of the stories and implementing them on their farm.

Table 14: When to Implement Change

Story No.	1	2	3	4	5	6	7	8	9	10	Total
Straight Away	18	9	9	8	5	13	6	7	5	7	87
2017	31	13	21	14	10	10	8	14	9	12	142
2018	1	6	1	3	2	0	6	1	4	1	25
2019	2	2	1	0	3	0	0	1	0	1	10
N/A	3	1	2	4	5	4	2	0	4	1	26
Total Farmers	55	31	34	29	25	27	22	23	22	22	

8.5 Implementation

Farmers were then asked what they saw in the digital story, that they could see themselves implementing on their farm. The online survey provided a free form text box for farmers to respond and the following analysis relates to what farmers could see themselves implementing on their farm as a result of looking at the digital stories.

Grass & Soil Fertility

Eighty-nine statements were made in relation to grass and soil fertility including; Improving grass yields; achieving 80% of slurry spread in Spring; spreading more

lime; taking regular soil samples; using a trailing shoe on a vacuum tank; draining poor ground; having a better use of nutrients; careful use of pesticides and fertiliser.

Water

Seventy-two statements were made in relation to reducing water usage on farm. Farmers said they were interested in areas relating to water such as; measuring water usage; installing meters to save water; reed beds; water recycling; rainwater harvesting; rainwater being fed to livestock; installing their own water supply; water sprinkling systems; more recycling of water; water reduction and conservation; new water tank systems and re-using the water to wash down dirty yards; fixing water leaks and lowering the amount of water used on the farm; using tanks for storing water and recycling of water from plate coolers.

Nature and Biodiversity

Fifty-five statements related to an interest in planting trees and maintaining hedgerows, leaving wild flowers to grow and leaving areas on the farm for wildlife. These farmers were interested in improving biodiversity on the farm by; planting more hedges; sowing clover into grazing areas; investigating bee keeping; replacing ditches; fencing and better use of sprays.

Energy

Fifty-one statements were made in relation to saving energy on the farm. Farmers were interested in areas relating to energy, having looked at the videos such as; using night rate; trying to be energy efficient on the farm and home; geo thermal heating; analysing electricity use and cost; and using plate coolers.

Breeding

Six farmers stated that they wished to work on improving their breeding programme and “using all A1 high fertility high milk solids Sires at the start of the breeding season” and improving the herd economic breeding index.

Other

Other comments in relation to the implementation of change included reducing waste on the farm and recycling and disposing of plastic. Some farmers commented on keeping the farmyard tidy and focusing on farm safety and expressed an interest in the backing gate (shown in one of the videos) and preserving old buildings. Five farmers stated that they are already undertaking these activities but commented that the videos still encouraged them to be more environmentally aware. Two farmers stated that they thought the video's lacked usable information/new information in the field so he couldn't make a decision on implementation. (This is further elaborated in later sections where farmers are interested in seeing videos that had a training element to them).

8.6 Reasons for their Answers

Farmers were asked to elaborate on their reasons for change. The answer to the reason for change in this category seemed to be predominantly profit driven along with farmers being influenced by identifying with the storyteller. This is elaborated upon in the following sections.

8.6.1 Profitability / Financial Implications / Increasing Efficiency

Ninty-nine statements related to changing practices due to the cost saving aspects of the stories saying that it was 'more economical' or that it was good for 'the pocket'. They wished to increase farm income, be more cost effective and improve profits. Comments included such as "More care for my environment doesn't have to cost me any money" and "That nature and good farming can exist on the same farm and sustainability may not cost farmers money".

Farmers were interested in grass and soil fertility in terms of increasing grass growth, making better use of slurry and saving money on fertiliser and in the cost benefits of using lime instead of fertiliser and the benefits of growing more grass. They believed that such actions might increase efficiency and profitability (they believed these changes would increase milk protein, improve the quality of pasture, reduce nitrogen and use less fertiliser).

Two of these statements related to not having the finances to make changes saying “Money is not available at this time” and “Money is tight so hopefully a better return next year and I can implement those plans”.

8.6.2 Identification with Storyteller

The statements made by farmers (in relation to the reason for implementing change), related to a large extent on identifying with the storyteller. Overall, there were **sixty-eight** statements in relation to this theme. Examples are detailed below to give a flavour of the comments:

“Michael’s approach to getting the basics right makes a lot of sense and is one we could all implement”.

“I’m in a similar situation to Michael”

“The video represents our situation fairly well”.

“Information given in a way I could relate to and makes me feel I could improve my farming”

“Farmers only have so much time, you have to prioritise what you have time for and what will make or save money. This video makes a clear and valid case for both, spoken from a man (Michael) who can walk the walk. Credibility”

“Michael has a clear focus which leads to sound practices. Gaining and maintaining a similar focus could help us all to improve our results.”

“I think similarly to these people”

“this clip is like my own farm and I can relate to it”

“Talking a lot of sense”

“I think like him”

“I can identify with Aidan’s way of managing his farm”

“I can identify with the work that is carried out on this farm”.

“I can identify with all the positives on this farm”

“I believe we all need to be doing what these guys are doing and be aware of what is under our feet”

“Good to get focus and prioritise key values”

“Everything Darragh said is true”

“Facts and figures are convincing evidence”

“Good technical information given in this video”

“Really enjoyed this short story which seemed to touch a lot of the messages that sustainable farming needs to get across”.

“Farmer is the guardian of the countryside”.

“it all makes common sense and when shown on the video, it’s not a big deal to carry out”

“All makes sense and easy to implement”.

‘Very enjoyable and informative’.

Farmers also stressed the need for practical, local examples saying “I’m happy to listen to scientific experts with regard to the environment but they must provide farmers with real-life practical solutions that will work in every county, not just in theory”.

Farmers admired the farmer saying ‘He is doing a great job’ and that the storyteller was ‘A farmer embracing the environment’. Farmers identified with the positivity of the story saying such statements as “I found it an inspiring piece of storytelling” and “see that we are doing a great job” and “Concentrate on the positives” and “looking after our environment is essential to good farm practices”.

Farmers expressed pride, having viewed the video’s saying: “We don’t give ourselves the credit that we deserve” and “Farm and farmer are a great shop window for milk production in West Cork” and “Overall a really good video and made me feel proud of our farming practices” and “Very clear video outlining the many positive changes a farmer can make”.

8.6.3 Nature & Biodiversity

Twenty-four statements related to an interest in change so as to protect wildlife habitats, to ‘give back to nature’, to ‘soften the landscape’ and to ‘live in harmony with nature’ and ‘to provide more shelter for cows as well as a haven for birds and bees’.

Examples of statements related to improving biodiversity included: “Because minding our bee population might just be one of the most important things we could ever do on our farms” and “Give something back to nature” and “To give birds and other wildlife a habitat”.

However, one of the farmers stated that “Poor ground may have a benefit for wildlife and nature but there is no financial benefit to leaving this type of land as it is so draining and cultivating is the best option.”

8.6.4 Future Generations & Family

Twelve statements related to family and future generations, with farmers stating the importance of the environment to future generations. Farmers spoke of the next generation with comments such as “I would like to ... improve things for the next generation” and “The farmer’s attitude is brilliant, we are just caretakers of the land, it hit me that he is so young and already thinking of succession” and others stating that they would like to get their children more involved in farming.

However, one farmer pointed out that “The Farm I run is not a family farm rather a commercial unit, it’s a good story from a family/generation point of view but I prefer facts and figures to show me true results on environmental possibilities from people in that field of expertise”.

8.6.5 Other Reasons

Nine statements related to wanting to reduce the carbon footprint on the farm, reducing carbon emissions and protecting the environment. A further seven respondents commented on the need for time to plan and implement change.

One farmer said that he approved of the ‘green image it sends out’ connecting the video perhaps with green marketing.

8.7 Summary of Part 1

The findings from this aspect of the research shows that farmers are positively disposed towards the digital stories. Importantly, the majority found the stories to have a positive influence on their attitude to making environmental change. The majority stated ways in which they could implement change on their farms (primarily in relation to grass, water and biodiversity). The main reasons for their willingness to implement pro-environmental practices related to the cost benefits of implementing change and identifying with the storyteller, being able to relate to the storyteller and to his farming circumstances. There was also a strong emphasis placed on family and future generations.

This research bears true of the literature review in which peer to peer communication, bottom-up, visual and emotional material can connect strongly with the audience. It also highlights how communication technologies can be used as facilitating tools for participation and engagement. It is hoped that this research adds to the lack of research on the construction of environmental communication in new media and the importance of how environmental communication is framed.

8.8 PART TWO: RESPONSES FROM FARMERS WHO COMPLETED THE FINAL SURVEY

Once farmers had looked at all 10 video stories, they were asked to complete a final survey. This group were asked the following final questions:

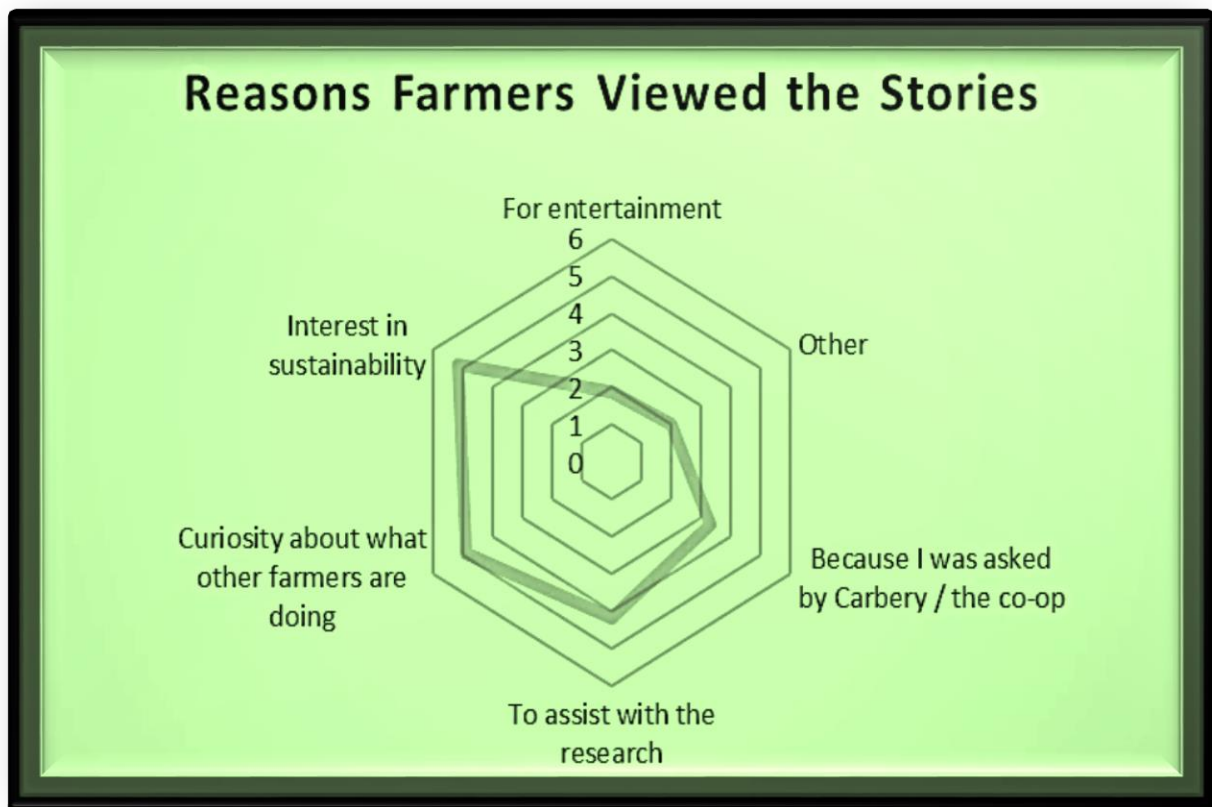
1. Why did you watch the video's made by farmers?
2. Having looked at all the videos, what do you think was the overall message from the stories?
3. Did the videos have an impact on your own farm practices in relation to sustainability?
4. This research is trying to find ways to influence farming practices to be more sustainable. Do you think that these stories are a good way to influence you and other farmers? If yes, why and if no, why not?
5. Have you any comments or recommendations?

Only 12 farmers stayed with the research until the end, they looked at all 10 videos and answered the questions after each video and the final questionnaire. This research recognises that this is a very small sample but the results are included here in order to provide what the responses were, which a larger study may build on in future research. The following sections provide a discussion on the results to these questions.

8.9 Why did you watch the videos made by farmers?

The results of this question show that this sample of farmers have a strong interest in sustainability, followed by a curiosity about what other farmers are doing and an interest in taking part in the research (chart 12).

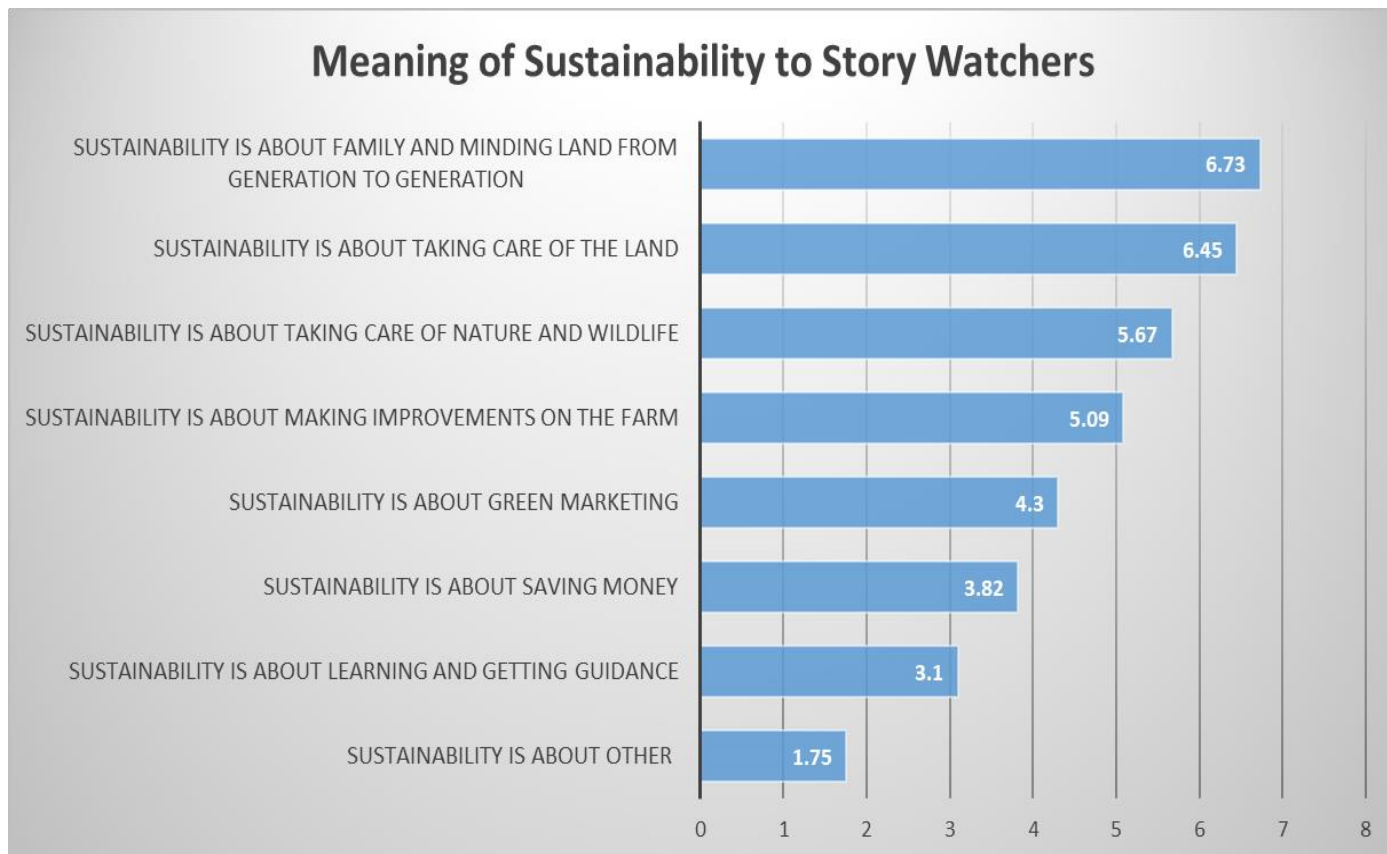
Chart 12: Reasons Why Farmers Viewed the Digital Stories



8.10 Messages conveyed by Stories.

Farmers were asked “Having looked at all the videos, what do you think was the overall message from the stories? (A ranking of 1-8 was provided with 1 being strongest). The following chart 13 presents the results to this question.

Chart 13: Results of the Meaning of Sustainability to Story Watchers



The results of this question indicated that the perceived predominant messages from the stories were related to 'family', 'taking care of land for future generations' and 'nature/wildlife'. This question mirrors the research in previous chapters where we aimed to understand the meaning of sustainability to farmers based on their digital stories. The results are echoed here in terms of the strong emphasis in relation to family, future generations and biodiversity.

8.11 Impact on Farm Practices in relation to Sustainability?

Farmers were asked if the digital stories had an impact on their own farm practices. Although this is a small sample, it is encouraging to see that all farmers answered this question with a YES statement.

8.12 Using Stories to Influence Farmers

Farmers were asked if the stories were a good way of influencing farmers to adopt pro-environmental practices. All farmers thought the videos had a positive influence. Comments focused on the credibility of the stories, being able to relate to the people who made them, the stories being down to earth and told in their own language. A flavour of these comments included:

- "It shows that good farming practices equals improving on sustainability. Their stories are told in farmers own words and images"
- "Good down to earth stories"
- "The videos are a good way of communicating the message. I think it has an impact when you see people you know. A lot of what we are doing are right and people need to hear this"
- "Not lecturing, more credible than Teagasc as it was farmers talking. Snappy, well produced. Presented new ideas in a tidy package. Also with Carbery backing, it adds credibility"
- "If farmers can see sustainable practices being a success for the farmer and the environment, they may adopt the practices themselves. Much better than government agencies etc".
- "The stories are relevant to our area and are delivered in our language"
- "Stories are very relevant and well told. Everybody can relate to them. Very

credible”

- “There are some great videos and should be shown to all farmers and customers alike”
- “I think that we are years ahead of other countries on the way we farm here in relation to the environment. I have seen a lot of farms abroad and they should be afraid of us. I think this message is not getting to the consumer enough”.

The only negative was in relation to the stories being a little “scattered” with the suggestion that each farmer concentrate on one topic per story. Examples of these comments included “I’m not sure if the focus of all the stories was on highlighting sustainable farming and found it a little scattered. Maybe if each farmer focused on one aspect, it might have been better. Some subjects were covered multiple times” and “More practical demonstrations where possible” and “Some repetition between clips.”

These are interesting comments in terms of using digital stories to promote the sustainable practices of Irish farming and also in relation to having practical demonstrations. The project Digital Green (discussed in chapter 2) focuses heavily on demonstration videos for farmers and has had very positive results in changing practices as a result of this. A further project or study could focus on this next step with farmers.

8.13 Changing Practices

The 12 farmers were asked if they had adopted any new practices and the following table 15 shows the results of this question. From this, one can see that the farmers are showing changing practices since viewing the digital stories. The digital stories may, of course, not be the only pro-environmental contact they have had since the study began, but nonetheless these results are encouraging.

Table15: Changing Practices

Q11: Which of the following have you done since last August 2016?

Answers	YES	NO	ALREADY DOING SO BEFORE AUGUST	NA	INTEND TO DO THIS IN NEXT 18 MONTHS	TOTAL
I have had soil fertility tests on my farm	25.00% 3	0.00% 0	66.67% 8	0.00% 0	8.33% 1	12
I have fixed water leaks	41.67% 5	0.00% 0	58.33% 7	0.00% 0	0.00% 0	12
I have spread more phosphorus than previously	36.36% 4	27.27% 3	18.18% 2	9.09% 1	9.09% 1	11
I have installed a new plate cooler	18.18% 2	18.18% 2	54.55% 6	0.00% 0	9.09% 1	11
I have installed a rain water harvesting system	11.11% 1	55.56% 5	11.11% 1	22.22% 2	11.11% 1	9
I have changed the heat settings to heat water at night to take advantage of the night rate electricity	18.18% 2	9.09% 1	54.55% 6	0.00% 0	18.18% 2	11
I have installed solar panels	0.00% 0	55.56% 5	22.22% 2	11.11% 1	11.11% 1	9
I have spread slurry on marginal land (Index 1)	30.00% 3	10.00% 1	30.00% 3	20.00% 2	10.00% 1	10
Where possible, I have shifted to a Spring application of slurry (if weather permits)	66.67% 8	0.00% 0	25.00% 3	0.00% 0	8.33% 1	12

Answers	YES	NO	ALREADY DOING SO BEFORE AUGUST	NA	INTEND TO DO THIS IN NEXT 18 MONTHS	TOTAL
I have used a trailing shoe for slurry application	25.00% 3	25.00% 3	16.67% 2	16.67% 2	16.67% 2	12
I am using the Economic Breeding Index (EBI) to select bulls for my cows	41.67% 5	8.33% 1	41.67% 5	0.00% 0	8.33% 1	12
I am putting the cows out to grass earlier in the Spring (if weather permits)	45.45% 5	0.00% 0	45.45% 5	0.00% 0	9.09% 1	11
I am spreading more urea than CAN	44.44% 4	22.22% 2	22.22% 2	0.00% 0	11.11% 1	9

8.14 Summary Part 2

A small number of farmers (12) looked at all 10 videos over the 10 weeks of the project. Results from these farmers show that the strongest reasons that farmers looked at the video related to their interest in sustainability and their interest in what other farmers (people like them/ peer to peer) were doing. Farmers interpreted the top messages from the video's as "Family" "Future Generations" and "Wildlife". All farmers said that the videos had an impact on their own farming practices and all farmers thought these type of stories would be a good way to influence other farmers. In the 13 practices used for this study, farmers showed a level of adoption of these practices since viewing the stories. Since viewing the videos, 3 farmers have done soil fertility tests, 5 farmers have fixed water leaks, 4 farmers have spread more phosphorus, 2 farmers have installed plate coolers, 1 farmer has installed a rain water harvesting system, 2 farmers have changed to night rate electricity, 3 farmers have spread slurry on marginal land, 8 farmers have shifted to a Spring application of slurry, 3 farmers have used a trailing shoe for slurry application, 5 farmers are using the EBI to select bulls, 5 farmers are putting their cows out to grass earlier and 4 farmers are spreading more urea than CAN.

This study recognises the small sample size but nonetheless the results are encouraging in terms of using digital storytelling as a tool to promote pro-environmental practices with farmers. It is recommended that a larger study be undertaken to test if these results will hold true when conducted with a larger sample.

CHAPTER 9: CONCLUSION



Source: *Emma Jervis.ie*

9.0 Research Questions and Summary of Findings

The thesis has highlighted the many ways in which sustainability is viewed in the literature review and related this to an analysis of the digital stories made by and shown to farmers in a part of Southern Ireland. The first research question asked what sustainability means to farmers and the analysis of the digital stories has informed us that farmers in this study, place a strong emphasis on taking care of nature and the land, the importance of place, looking back at previous generations and caring for future generations. One of the strongest themes borne out by the research is in terms of the family. In many respects, one could say that for the majority of farmers that sustainability = family. This is echoed and reinforced by other studies on rural Ireland including the work of Hilary Tovey, Arenserg and Kimball.

One of the other strongest emerging themes from the stories is the concentration on nature and biodiversity. Interestingly, the focus on the economic aspects of sustainability (cost factors, both from an expense and a savings perspectives), although included in the stories, does not come across as one of the key themes.

Instead, the most striking aspects of the digital stories is about being connected to family, land and place. The narrative analysis shows us that it is not only what the stories say but what they do not say that is revealing.

For all the stories, sustainability is about, what the literature review has called Business as Almost Usual (BAAU) i.e., it is about sustaining what we already have whilst not damaging the environment. All farmers concentrated on continuing their current model of farming and sustaining the current, albeit altered, practices. The emphasis was on performing the farm practices in a way that would be better for the natural environment. The discussion in the literature in terms of productivist and extensive methods of agriculture were not mentioned in the stories. Nor was there any mention of a need or a willingness for radical change in terms of farm practices. However, the emphasis of the stories is on taking advice from Carbery, the Co-operatives and Teagasc so farmers show a strong willingness to learn and are following what is presented to them as good practice.

Also, we need to remember, as discussed in the background chapter, major changes to farming would take enormous structural, organisational and cognitive re-organisations. This is due to the complex arena of power relations and productivism in which farmers operate. Farmers are often faced with making daily decisions in a setting and context that they did not create, in terms of who has political power, who has control over resources and, in a broader sense, what infrastructural and technological options are available. In an agricultural context, productivism consists of rules that are created by strict government regulations driving production, and global markets that demand standardisation of produce. These rules have developed over such long periods of time that they have fostered norms, where farmers have become locked-in to such an extent that they generally take the rules for granted. Although, this thesis focuses on the individual farmers and the influence of peer-to-peer communication, it acknowledges that there are webs of power and influence within Irish farming is situated and that behavioural changes or changes to practices won't be sufficient on its own to make the changes necessary to reduce carbon emissions. The literature review also discusses the green political economy as an alternative to neo-liberalism and productivism.

The focus of the stories is on existing farm economics, including producing high quality milk, green marketing and being competitive. A large amount of time in the stories was given to discussing improving current farm practices and about learning how to do this and getting relevant advice in relation to same.

The concept of caring and connectedness, particularly to nature, to family and to a continuity between generations is a constant in the majority of the stories and this bears out the similar themes expressed in the literature review, such as to the concept of flourishing expressed by Ehrenfeld (Ehrenfeld & Hoffman, 2013) or the concept of spirituality, connectedness and care expressed by Kieran Keohane (Keohane, 2017). In terms of the concept of stewardship within the Anthropocene, there is a strong emphasis in the stories of farmers being stewards of the countryside and being custodians of the land.

The literature review found that place is important when discussing sustainability. This is borne out by the farmer stories in this study where not only are there numerous mentions of place but the stories point to an underlying deep connection to place. The literature review tells us that individuals often find sustainability too overarching a concept that is essentially 'happening somewhere else'. This focus on place is important from this respect as sustainability is put into a local context and may be particularly relevant in terms of communicating about sustainability to other farmers.

Skibbereen farmer presents digital showcase in Rome

DECEMBER 1ST, 2016 10:10 PM
BY SOUTHERN STAR TEAM



Pictured in Rome where Michael Crowley of Bauravilla, Skibbereen, presented his 'Digital Story' of farm life to the UN Food and Agriculture Organisation at a recent agriculture conference were – from left – Denis Lucey, representing UCC and Gorta; Marguerite and Michael Crowley and Damien Kelly, Fir

Source: Southern Star, at presentation to the UN Food and Agriculture Organisation

Furthermore, there are a number of themes which did not appear to emerge strongly in the literature but which do so in the stories and these are in relation to 'legacy' and 'pride'. Both legacy (in terms of what farmers impart after they have passed) comes across strongly in many of the stories and having pride (in what they do in this life and how they develop and make changes on the farm) is also imparted by the digital stories).

Essentially, for these ten farmers, sustainability is about: family, nature, caring, generations, connectedness, legacy, pride, modifying practices, earning a living and learning.

As the study focused on stories from only ten farmers, the thesis investigated the similarities and differences from these ten farmers to a wider group of 193 farmers in the same region. From the analysis, the two groups show a large number of similarities with some minor differences. From this, we can propose that the results of the story analysis could be inferred to a wider group of farmers (i.e., if the wider

group were to make digital stories, that their stories may be somewhat similar to the group of ten story-makers). The minor differences found in the analysis revealed that the wider group show a higher level of interest in financial incentives (compared to the story-makers), there is a higher likelihood of being influenced by what Carbery Foods think is important and they have a higher interest in green marketing. Furthermore, the story-makers show a higher level of knowledge in terms of being able to adopt pro-environmentally practices and the ease with which they could do so (which most likely relates to the training they have received from the Carbery Greener Dairy Farms Programme). Similarly, the story-makers show a higher level of concern for nature and a higher level of emotional attachment to their farms. The majority of these variations are small so these are tendencies more so than broad differences. Essentially, the wider group show a slighter higher level of concern in relation to costs and are motivated slightly more by outside factors rather than the story-makers who tend to be more intrinsically (personally) motivated. From this analysis, it appears that there is a high degree of similarity between the story-makers and the wider group of farmers in this research study.

The study proceeded from this to examine what needs to happen for farmers to adopt environmentally friendly practices, from the perspective of the farmer. From asking this question, we have learned that there is a dominant thread in the narrative that all farmers need a better understanding of good environmental practices and its benefits, more advanced practices need to be costed and the rewards for implementing them explained fully so farmers can adopt them quicker. But farmers do not believe that changes should come at a cost to them as they believe that with the current price of milk and the hours that they work, that they are already not adequately rewarded. The narrative tends to point to a dissatisfaction by farmers in relation to the current milk prices being achieved, before even considering cost implications of adopting environmental practices, which farmers believe would incur more financial cost.

The picture which emerges from the analysis is of a group who feel that they are under pressure from regulations and who believe that they are not rewarded adequately for their work/product and an inference that other players in the market (e.g., retailers) get compensated more than they do. The majority of farmers' point to the need for grants, incentives and subsidies for adopting new practices and that

by and large, this should come from the Department of Agriculture. A large group of farmers believe that the adoption of practices would need to be funded by an increase in the price they receive for milk currently. They do not believe that producing a 'greener' product will result in a higher price. But some farmers do believe that with increased marketing, perhaps this could change. Farmers in this group believe that if they got an increased price for the milk, then change could certainly be possible.

A large amount of statements indicated that farmers are trying to be environmentally friendly, but are seeking more information and education on what they need to do better, at what cost that will come, and what will be gained environmentally and financially. Farmers also pointed out a need for more schemes in order to increase environmental practices. Farmers believe that this would make it easier to adopt practices and result in more efficient and pro-environmental ways to farm.

Furthermore, farmers believe they should be trusted to make decisions on their own farms. There were further specific statements in relation to different government bodies working together with the farmers and the co-operatives and for an emphasis on groups which are locally based. A narrative also emerged from the data that farmers wish to be viewed in more of a positive light and wish to do the best for the land and to be custodians of the land.

A lack of common sense is also highlighted and that practices need to be practical, easily implemented and schemes and policies need to make sense and not to contradict each other. Farmers believe that much of the blame for environmental problems is being laid at the farmers' door and that the current price of milk and the lack of incentives does not help the situation.

Interestingly, the majority of farmers appeared willing to adopt environmentally friendly practices on the basis that they would not cost them more and based on education and schemes being available to support them. The narrative, overall, is driven by economics i.e., if actions and practices do not make sense from a monetary viewpoint, they will not be adopted.

The narrative also describes a group who feel under pressure both financially and in terms of working hours and an underlying sense that they are being blamed for the

situation whereas they are willing to change in the right circumstances but they are not willing to be the ones to pay for it.

The findings of the research show that farmers are positively disposed towards the digital stories as a method of communication. Importantly, the majority found the stories to have a positive influence on their attitude to making environmental change. The majority stated ways in which they could implement change on their farms (primarily in relation to grass, water and biodiversity). The main reasons for their willingness to implement pro-environmental practices related to the cost benefits of implementing change and identifying with the storyteller (being able to relate to the storyteller and to his farming circumstances). There was also a strong emphasis placed on family and future generations.

This research bears true of the literature review in which peer to peer communication, bottom-up, visual and emotional material can connect strongly with the audience. It also highlights how communication technologies can be used as facilitating tools for participation and engagement. It is hoped that this research adds to the lack of research on the construction of environmental communication in new media and the importance of how environmental communication is framed.

A small number of farmers (12) looked at all 10 videos over the 10 weeks of the project. Results from these farmers show that the strongest reasons that farmers looked at the video related to their interest in sustainability and their interest in what other farmers (people like them/ peer to peer) were doing. Farmers interpreted the top messages from the video's as "Family" "Future Generations" and "Wildlife". All farmers said that the videos had an impact on their own farming practices and all farmers thought these type of stories would be a good way to influence other farmers.

This study recognises the small sample size but nonetheless the results are encouraging in terms of using digital storytelling as a tool to promote pro-environmental practices with farmers. It is recommended that a larger study be undertaken to test if these results will hold true when conducted with a larger sample.

9.1 Effectiveness of Methodology

The central innovative method adopted for this study was the use of digital storytelling as a method of data collection. The ambition was to alter the traditional relationship between the 'researcher' and the 'researched' by the use of this method. The methodology chapter has provided many different examples of how digital storytelling has been used and this research adds to this body of work by using this arts-based methodology in an agricultural setting.

Having conducted this study, I believe that the use of digital storytelling as an arts-based methodology can yield some extremely interesting insights that other research methods may struggle to uncover. This methodology can be used in a wide variety of research settings and is not limited to the area of sustainability. I believe the strength of the approach is in investigating difficult to understand phenomenon where there are complexities and subtleties that are hard, not only for the researcher but also for the researched, to verbalise. In this sense, digital storytelling provides a type of 'quiet space' where the research participant can consider their own views and thoughts in relation to their lived experiences and to select from these which are the most important for them to communicate. The fact that they do this without the presence of the researcher can lend a greater degree of authenticity to the data which emerges from this process.

In summary, this thesis finds that conducting research in this way, can produce extremely valuable insights into how people experience the world and what they place importance upon and that the first person narrative, which is often emotional, can have an impact on viewers, in terms of their engagement to the themes of the stories and their readiness to adopt changing practices.

9.2 Impact of this Work & Contribution to Knowledge

This study has aimed to help readers to understand farmers' relationship with sustainability and to better understand the meanings of sustainability to this cohort of society. It furthermore examines farmers' reflections on 'what needs to happen for farmers to adopt environmental good practice' and trialled the use of digital stories as a way to engage farmers in change.

The topic of sustainability is extremely important as the Government takes on our new and very ambitious targets. The Programme for Government 2020 outlines Ireland's commitment to reduce Ireland's greenhouse gas emissions by 51% over this decade and to achieving climate neutrality by 2050. These targets will be set in law by the Climate Action and Low Carbon Development (Amendment) Act 2021 and the actions to be taken to achieve these targets will be set out in an updated Climate Action Plan.

Ireland's Climate Action Plan will provide a roadmap to reduce greenhouse gas emissions and tackle the climate crisis. It will provide specific actions that Government Departments and public bodies will take, together with a timeline for completion of each action.

The first Plan was published in 2019 and work is underway to develop the next version which will reflect the step up in ambition committed to in the Programme for Government. The Climate Action Plan 2021 has been published and will be updated annually. Agriculture is a large part of this plan as agriculture was responsible for 35.4% of Ireland's greenhouse gas emissions in 2019. The main sources of emissions come from methane emitted by cattle and sheep, fertilisers, manures, animal faeces and urine and diesel for agricultural machinery. The Government plans to lead and support farmers transitioning to more sustainable farming systems.

It is hence extremely important that we understand what sustainability means to farmers, how to engage with farmers in new and innovative ways and to learn from the farmers' perspectives of what needs to happen for them to adopt environmentally friendly practices. This thesis has contributed to this very important area and offers new findings in terms of farmers' understandings of sustainability. In relation to reducing carbon emissions, engaging farmers in meaningful ways to support practice change will be extremely important and using digital stories to engage farmers in a peer-to-peer manner has been shown as a potentially useful way to do this.

Adopting effective and sometimes new methods of communication and dialogue will be important to the delivery of the plans to reduce carbon so substantially in a short timeframe. The thesis advances knowledge in this field.

The use of digital storytelling is an innovative method to perform research and yields very interesting results by re-imagining the relationship between the 'researcher' and

the “research participant”. This type of methodology has the potential to be used in a variety of settings and the research provides a demonstration of how it has been used in relation to farming. This could be applied to many other areas and further discussion on this area is available in the section on future research.

It is intended to share the knowledge gained from this research in a variety of settings including through presentations, conferences and by publishing journal articles.

I believe the impact of this work has been that it has initiated some interesting discussions between and among farmers on the meaning of sustainability in the study region. The literature review has pointed to the need for discourse among all parts of society on sustainability and this research has contributed to this.

The involvement of the food company Carbery Foods Ltd was an important relationship for this study. Similarly, Carbery found their involvement in the project a useful one. They placed all of the digital stories produced in the study on their website and also did a further digital storytelling project themselves with other farmers, after my own research was completed. This produced a further 9 digital stories which Carbery placed on their corporate website. The Sustainability Manager has subsequently informed me that they have played some of the stories in meetings with global food producers and they had been well received. They also invited one of the farmers to play the story that he had made at a UN conference in Rome, at which Carbery were presenting.

9.3 Insights / Self Reflection

For other researchers approaching using an arts-based methodology, such as digital storytelling, I believe that this type of research requires an element of trust in the process. In reality, I was not sure when I started this study whether in fact farmers would actually make digital stories for the study or indeed when they did make the stories, what quality these videos would be. Would the digital stories provide insightful research data? This required a certain ‘leap of faith’. If I had been doing the research in a more traditional vein, for example using a questionnaire to assess the meaning of sustainability to farmers, I would have had more control over the process as I would have been there when the farmers were giving answers to

questions, from which I could probe and clarify as required. The study similarly required another 'leap of faith' by the farmers who had never made a digital story before these ones and gaining the trust of farmers was an important part of the research process. Along with this, the research was carefully planned and set up including an emphasis on communication with the participants, the provision of training on the technical aspects and a workshop on storytelling. The process placed emphasis on building positive relationships of trust between the collaborators, myself and the farmers. As discussed, digital storytelling provides a different type of methodology and the results chapters from this thesis has outlined how fruitful this data was to the study. My reflections on having done this work, is to plan this methodology very carefully and that the results one can glean are very insightful.

On another note sometimes, researchers may be hesitant in terms of working with groups of people who may not have extensive knowledge and skills of media equipment but this did not pose any difficulty in this study. The study found a good level of technical skills in the group and this was supported by the training and also by younger members of the family taking part in the making of the digital stories. Involving the wider family in terms of the making of the stories was a critical part of the successful completion of the stories and was also an enjoyable experience for the story-makers (something which would rarely be said of completing a questionnaire!).

In terms of the approach I took, I believe that the relationship with the food company selected to work in collaboration with was extremely important to operationalising this research. Should another study of this type be undertaken, I believe that finding a suitable partner who the researcher can develop a good relationship with is extremely important. This relationship tended to validate the research objectives to the research participants and 'open doors' to the suppliers of the food company and to the co-operatives to which the farmers belonged. However, strong boundaries in terms of the setting up and conducting the research are extremely important in terms of the independence of the research output and here ground rules with any partner are essential from the outset.

As a final point, the workshops provided were also very important not only in terms of providing information and training but also as a group process for the farmers / research participants.

9.4 Limitations of this Research and Recommendations for Future Research

This study recognises that the ten digital stories that were made as part of this research represents a small sample. The likelihood of the results from the analysis of these stories expanding to a wider group of farmers has been explored in this study by examining similarities and differences between the groups studied. To better understand the implications of these results, future studies could undertake a larger research study focusing on a higher number of digital stories.

The approach I took to the second part of the research in terms of sending the videos to the wider group of farmers each week resulted in lower than anticipated numbers of individuals viewing the stories. I believe that views may have been higher if the digital stories concentrated on specific subjects each week rather than providing the viewer with ten separate views of sustainability. This, in itself, is an interesting finding. But as the research question was to understand the meaning of sustainability to each farmer, the outcome of this part of the research was naturally ten separate perspectives. I also believe, having gone through this process, that some of the digital stories may benefit from being shortened in places so as to keep the viewer's interest.

This study was examining the use of digital storytelling to understand sustainability and to engage and influence other farmers. A separate study could build on this research and examine the use of digital storytelling, more so from the perspective of providing information and training on certain pro-environmental practices as told by farmers who have adopted these practices. This would be somewhat similar to the project Digital Green which has been highlighted in the literature review. These types of training and information stories could keep the personal theme that appears to have worked in this study and could be done in conjunction and as a support to other types of peer-to-peer support such as Discussion Groups and other

communications organised by the co-op's, food companies, farmer representative and advisory organisations.

Another suggested study could share digital stories on social media and garner the responses to them based on the comments in the news feed. There appears to be little research in relation to 'new' media as the literature review has outlined and I believe that this could provide useful insights, on the impacts of such videos and the analysis of news feed comments would make for an interesting methodology in and of itself.

It would also make an interesting further study to adopt a different approach to the dissemination of video's, one of these that could be considered from the literature review, is to have community 'showings' of the videos in a local hotel / community centre and have facilitated discussions after each.

Another avenue for future research would be to concentrate on the impact that the *making* of the digital stories has on the research participant. There is extensive information in the literature review in relation to this, particularly around the area of reflection and how reflection impacts on learning and growth in the research participant. It would be a very interesting study to examine the use of digital storytelling in this regard. This may have some useful insights in areas such as health – particularly mental health - where participants would reflect on their lived experiences, particularly of challenging or difficult times. This, would obviously, require a greater emphasis on the ethical dimensions of the study.

Another suggested area for future research could be in the area of localities or communities who wish to identify themselves as being 'green' or 'environmentally friendly' or 'Eco'. Developing a suite of stories around this theme for a town or village may be an interesting use of digital storytelling. Similarly, the same type of approach could be used in terms of history, heritage and tourism, giving voice to local people and connecting to a wider audience.

In relation to the broader area of agriculture, another study could examine sustainable futures in relation to Irish Agriculture, which may in part be based on older traditions and some of the concepts raised in this thesis including stewardship, being custodians of land and land being 'borrowed' from one generation to the next. A large amount of what is written in relation to the environment at the moment,

comes from an engineering, economic or scientific viewpoint and a heightened focus on the more cultural and psychological aspects of farming would be very useful to understanding this complex area.

The digital stories themselves could be interpreted, through the emotions and ideas, to suggest a different model of farming (than agri-business which focuses on land as an asset), and which concentrates on caring for the land whilst having a sufficiently productive relationship with it and taking care of family.

However, even if farmers want to engage in particular practices, they are in a structure that is dictated by outside forces such as the Irish government and the EU in terms of trading in a competitive market place. To a large extent, as discussed in the background chapter, farmers choices are constrained by the larger structural conditions in which they operate..

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APPENDICES

APPENDIX 1: EXAMPLES OF THE USE OF DIGITAL STORYTELLING IN RESEARCH STUDIES (OUTSIDE OF THE ENVIRONMENTAL AREA)

Health Promotion

Storytelling is emerging as a powerful tool for health promotion. Whether smoking cessation, obesity, or cancer screening, many of the key issues in public health today require the sharing of information in a meaningful way that resonates with the receiver and triggers a positive change in knowledge, attitudes and ultimately behaviours. Lay public largely sources its information on scientific matters in narrative format, for example, from mass media, which relies on storytelling to optimise engagement with the reader, listener or viewer. In addition, most health related knowledge and/or evidence is largely objective, often referring to statistics and appeals to logic and reason to support a certain practice or health-related behavioural change. However, there is a growing movement towards other forms of health communication including storytelling.

For example, in a study of 230 African Americans with hypertension, Houston et. Al. (Thomas K Houston, 2011) concluded that narrative communication can break down cognitive resistance to behaviour change messages and that it was a suitable mechanism for addressing the persistent and troubling disparities in hypertension control. This, they called a para-social interaction, which created homophily between patient and storyteller and rendered viewers more susceptible to behaviour change messages. They found that patients with uncontrolled hypertension who received a storytelling intervention with culturally sensitive messages that promoted hypertension control benefitted from this study.

This PhD similarly researches the effect that this type of DST intervention can have on farmers in relation to sustainability and the results are outlined in chapter 8.

Education

According to Yuskel, Robin and McNeil (Yuskel, Robin, & McNeil, 2011) digital storytelling in an educational setting is a process of creating short stories that allows students and educators to enhance their information gathering and problem-solving skills, and to, facilitate the ability to work in a collaborative team. Respondents describe the social skills created as 'community connections', the possibility to know other people and understand that their identities which are connected within a social context. According to Yuskel, Robin and McNeil (Yuskel, Robin, & McNeil, 2011) digital storytelling also improved students' sense of community empathy and collaboration and social interaction and communication skills.

In another study on the use of this approach in education, Rina Benmayor (Benmayor, 2008) similarly concludes that the process of digital story making empowers and transforms students intellectually, creatively and culturally. Thus, she says, that digital storytelling can be seen as a signature pedagogy for the new humanities in the 21st century.

In a study by Smeda, Dakich and Sharda (Smeda, Kakich, & Sharda, 2014), their overall research question is: How can digital storytelling enhance the student engagement and provide better educational outcomes for learners? In addition to classroom observations, a scoring rubric was used by teachers to assess the quality of the digital stories created by the students. The stage had two different aims: to assess the level of student engagement, and document the educational outcomes achieved through digital storytelling. An evaluation rubric created by the University of Housing in 2011 was chosen as a guide to create the rubric for their research. The evaluation rubric included nine criteria; these are: Purpose, Plot, Pacing of Narrative, Dramatic Question, Story Content, Grammar and Language usage, Technological Competence, Emotional Content and Economy of Content.

In another study by Carmen Gregori (Gregori-Signes, 2008), she concludes that digital storytelling is a good way to engage students in both traditional and innovative ways of telling a story. Similarly, Martin Jenkins and Jo Lonsdale (Jenkins & Lonsdale, 2007) agree

that students appear to like the product as something that is engaging and something to be proud of, students, they say, find stories appealing if they connect with their own experience and that this technique does offer an opportunity to enable this.

They also state that the digital nature of these stories makes them ideal for storage and easy retrieval, thus making them available for review at regular intervals to make personal and group development explicit, and become part of an organised collection of evidence of reflection. This, they say, encourages the acquisition of 'learning about and learning to be skills for lifelong learning and the development of skilled twenty first century citizens. Another interesting educational study by Hull (Hull & Katz, 2006) examined the multimedia literacy of digital storytelling and the social context for learning provided through a community technology centre called DUSTY (Digital Underground Storytelling for Youth).

Coastal Health

Emerging from a Vancouver Coastal Health SMART Fund Conference in 2007, "Our Stories" is an ongoing initiative that is working to build community capacity by supporting stakeholders to 1) explore how stories can be used in reporting, funding applications and communications with others; 2) brainstorm cost effective ways to integrate storytelling into current or planned projects and programmes and 3) explore the spoken word, art, photography, videography, popular theatre and more to capture the stories of change. (www.ourstories.vch.ca)

A second study used storytelling as a methodology to investigate customers of retail banks. Rooney, Lawlor and Rohand (Rooney, Lawlor, & Rohan, 2016) applied storytelling as a methodology to investigate the following research question; why do consumers chose to remain in long term relationships with which they are dissatisfied or no longer committed to? They used this methodology, they say as understanding the internalised process of consumers can be difficult and traditional research methods may not be effective in accessing consumer cognitions as they relate to complex behaviours.

They believe that applying a storied approach allowed the research to explore the contemplative space within which attitudinal dissolution of a relationship may occur and probe the motivations and rationalisations leading to the decision not to exit. These kinds of studies provide a background for my primary research and the following sections now outline how I approached my own methodology.

APPENDIX 2: Agreement with Farmers

You are being asked to take part in a research study. We are asking you to take part because you indicated your interest through Carbery Group. Please read this form carefully and ask any questions you may have before agreeing to take part in the study.

What this study is about: The purpose of this study is to learn about farmers' attitudes, motivations and beliefs with regard to pro-environmental behaviours. You must be part of the Carbery Greener Dairy Farms Programme to take part in this study.

What we will ask you to do: If you agree to be in this study, we will conduct an interview with you. The interview will take approximately 30 minutes to complete. With your permission, we would also like to tape-record the interview.

Compensation: You will receive an iPad for your participation in this study. Please note, that participants must complete their video in order to receive the iPad. Participants who do not complete their video must return their iPad to the research team.

Your answers will be confidential. The records of this study will be kept private. Any reports released regarding the project will not include any information that will make it possible to identify you. Research records will be kept in a locked file; only researchers will have access to the records. If we tape record the interview, we will destroy the tape after it has been transcribed, which we anticipate will be within three months of its taping.

Videos: As part of this research, you will be creating your own digital story video. With your permission, these videos will be published online on Sustainability Stories West Cork social media accounts, and on other partners' website or social media accounts.

Taking part is voluntary: Taking part in this study is completely voluntary, you may skip any questions that you do not want to answer. If you decide to take part, you are free to withdraw at any time.

If you have questions: The researchers conducting this study is Maeve Bowen. Please ask any questions you have now. If you have questions later, you may contact Maeve at mbowen@macroom-e.com or 026-20520. You will be given a copy of this form to keep for your records. I have read the above information, and have received answers to any questions I asked. I consent to take part in the study.

Your Signature: _____ **Your Name (printed)** _____ **Date** _____

In addition to agreeing to participate, I also consent to having the interview tape-recorded.

Your Signature: _____ **Your Name (printed)** _____ **Date** _____

In addition to the above, I also consent to having my video disseminated online.

Your Signature: _____ **Your Name (printed)** _____ **Date** _____

APPENDIX 3:

GUIDANCE SHEET GIVEN TO EACH FARMER WHO MADE A DIGITAL STORY (Tips) TIPS FOR CREATING DIGITAL STORIES

Digital storytelling is an exciting and creative process. It takes a bit of time and some organisation, but it is relatively simple (with a little guidance) to create very meaningful stories. This is a tip sheet to help offer you some suggestions to make the process as easy and as do-able as possible.

FOCUSING THE STORY

The most important part of the digital story is, of course, the story itself. It is best to first think about what story you want to tell, and how to do it through a combination of words, photos, images and music. Personal stories are probably the best

The stories shouldn't be too long, especially in your first attempt at making one - 300 to 400 words, and no longer than 3 minutes. So in thinking about the story you want to tell consider the following questions (not an exclusive list):

1. What is the main point of the story?
2. How can you capture the point of the story through featuring key experiences and images?
3. Who is the intended audience? (in this situation, the stories are most likely going to be viewed by other farmers, like yourselves or by people interested in farming and the environment)
4. What do you want people to learn? To feel? What message do you want them to walk away with?

In telling your "story for sustainability" you might think of the following questions: -

1. What kind of 'environmentally friendly practices' have I done on my farm? (this question is not specific to a time or to a programme, it can be any environmental improvement you have made)
2. What motivated me to do this?
3. What has been the benefit to me, my family, the farm, the wider community?

REMEMBER: There are no right and wrong answers here.

YOUR COMPUTER

You have been given an iPad to make your story. You will be shown how to use iMovie at the workshop.

The Script

When you are making your story, it's easiest if you have the script actually written out, so you can read from it when you are creating the audio file. Try to keep it shorter than 400 words (we'll be covering how to write your script in the workshop).

Images

1. Personal photos work best. Old photos and new photos are both good. You can use your iPad to take new photos and upload them to iMovie.
2. You don't necessarily need to use all personal photos; you can also download images that are copy-right free or royalty-free and in your credits of your story, list who or where you got the image/photo from.
3. When you put your story or script with the images (called "storyboarding"), think about whether your words and pictures match each other or enhance the meaning.

Music

We recommend that you use only instrumental music that you write, or sing or that you have permission to use. Music must also be copyright free or royalty-free. You can download some royalty free music at the following websites, though there are also others:

www.marmosetmusic.com

www.stockmusic.net

We'll help you with this at the workshop.

ENJOY!

APPENDIX 4: QUESTIONNAIRE

Background Information on Respondent:

Farmer Name: _____

Address (town): _____

Co-operative: _____

Age group: 20-30 30-40 40-50 50-60 60+

Level of Education: Primary Secondary Third Level Specific Farming Courses

Will other members of your family take over the farm after you retire:

How long have you been involved in the Carbery Greener Dairy Farms Programme? 1yr 2yr 3yr 4yr

Instructions:

“The questions in this survey make use of rating scales with 7 places; you are to circle the number that best describes your opinion. Some questions may sound like other questions but don’t worry about this. In making your ratings, please remember the following points:

* Be sure to answer all items – do not omit any.

* Never circle more than one number on a single scale.”

Start time: _____ Date: _____

PAST BEHAVIOUR			FUTURE INTENTION			
As a result of your involvement with the Carbery Greener Dairy Farms, which of the following have you done in the last 4 years (or whatever time period when you joined the programme)?			Which of the following (which you have not done) do you intend to do within the next 18 months			
YES	NO	ACTIVITY	YES	NO	MAYBE	N/A
		I have had soil fertility tests on my farm				
		I have fixed water leaks				
		I have spread more phosphorus than previously				
		I have installed a new plate cooler				
		I have installed a rain water harvesting system				
		I have changed heat settings to heat water at night to take advantage of the night rate electricity				
		I have installed solar panels				
		I have spread slurry on marginal land (index 1)				
		Where possible I have shifted to a Spring application of slurry (if weather permits)				
		I have used a trailing shoe for slurry application				
		I am using the Economic Breeding Index (EBI) to select bulls for my cows				
		I am putting the cows out to grass earlier in the Spring (if weather permits)				

		I am spreading more urea than CAN					

ATTITUDES

The degree to which a farmer has a favourable or unfavourable attitude of the behaviour in question.

In general, implementing environmental practices is too expensive

agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

In general, environmental practices are very expensive but worth it in the long run

likely: __1__: __2__: __3__: __4__: __5__: __6__: __7__: unlikely

In making a decision to implement an environmentally friendly practice, the cost is more important than the environment

agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

Some environmental changes are essential regardless of money, time and bureaucracy

agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

For me to gain a better understanding of environmentally friendly practices on my farm is:

Important: __1__: __2__: __3__: __4__: __5__: __6__: __7__: not important

I am interested in implementing good environmental practices because it will ultimately lead to greater opportunities for grants and other supports

agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

SUBJECTIVE NORMS

Perceived social pressure from important others to perform or not to perform the behaviour

The reason I am implementing environmental practices on my farm is that Carbery Foods/the Co-op thinks it's important

True: __1__: __2__: __3__: __4__: __5__: __6__: __7__: False

The reason that I am implementing environmental practices on my farm is because it is important to me personally

Important: __1__: __2__: __3__: __4__: __5__: __6__: __7__: Not important

I am interested in good environmental practices because there is a huge opportunity in green marketing of milk products

agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

PERCEIVED BEHAVIOURAL CONTROL (PBC)

The perceived ease or difficulty of performing the behaviour and the degree of control felt

I am confident that I can adopt pro-environmental practices on my farm

Agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

For me to change to environmentally-friendly practices on the farm is relatively easy:

Extremely easy: __1__: __2__: __3__: __4__: __5__: __6__: __7__: extremely difficult

MORAL NORMS

The degree of moral obligation to perform the behaviour and the degree of regret if not performed

Implementing environmentally-friendly practices on my farm will help safeguard the farm for future generations

Agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

Implementing environmentally-friendly practices on my farm will have a positive impact on nature including animals and birds

Agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

I am implementing environmentally friendly practices on the farm because I have an emotional commitment to this farm and taking care of the environment is part of that

Agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

I am implementing environmentally friendly practices because green production is a more sustainable approach

agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

GROUP NORMS

Perceived pressure by other farmers and groups to perform the behaviour and perception of other farmers performing the behaviour

Good environmental practice is good for my local community

Agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: Disagree

Implementing environmentally friendly practices, sets a good example for my family

Agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

Implementing environmentally friendly practices, sets a good example for other farmers

Agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

SELF IDENTITY

Extent to which the farmer perceives the behaviour as part of himself

As a farmer, I believe myself to be an environmental advocate/leader

Very much: __1__: __2__: __3__: __4__: __5__: __6__: __7__: Not at all

I feel more energised and satisfied when I know that I am doing something good for the environment

Very much: __1__: __2__: __3__: __4__: __5__: __6__: __7__: Not at all

As a farmer my main role is to produce food in an efficient way

agree: __1__: __2__: __3__: __4__: __5__: __6__: __7__: disagree

As a farmer my main role is to protect the environment

agree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : disagree

SOCIAL IDENTITY

Degree to which the farmer sees himself as part of the farmers community

Most farmers, like me, are taking on environmental practices on their farms

Agree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : disagree

Farmers are the mainstay of rural Ireland

Agree : __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : disagree

Farmers are the ones most closely connected to the environment in Ireland

Agree : __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : disagree

Farmers understand the environment in ways that experts often fail to appreciate

Agree : __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : disagree

Most people who are important to me approve of my environmental practices.

Agree : __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : disagree

PERCEIVED EFFICACY

Positive or negative perception and the efficacy of the practice

Implementing good environmental practice on my farm is good for the environment in my area

Agree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Disagree

Implementing environmental practices on my farm will make an important contribution to reducing climate change

Agree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : disagree

MOTIVATION TO COMPLY

Positive or negative perception and the efficacy of the practice

I adopt good environmental practices because it's an important Teagasc priority

Very much: __1__: __2__: __3__: __4__: __5__: __6__: __7__: Not at all

I adopt good environmental practices because it's an important Carbery priority

Very much: __1__: __2__: __3__: __4__: __5__: __6__: __7__: Not at all

Cork County Council expect me to implement environmentally friendly practices

Very much: __1__: __2__: __3__: __4__: __5__: __6__: __7__: not at all

I feel my family and friends would be disappointed if I didn't adopt good environmental practices on my farm

Very much: __1__: __2__: __3__: __4__: __5__: __6__: __7__: Not at all

I care what people in the local community expect me to do in relation to environmentally friendly practices on my farm

Very much: __1__: __2__: __3__: __4__: __5__: __6__: __7__: Not at all

The threat of fines and/or being reported in the local paper motivates me to adhere to environmental regulations on my farm

Very much: __1__: __2__: __3__: __4__: __5__: __6__: __7__: Not at all

QUALITATIVE QUESTIONS

Are you ever frustrated by environmental policies? / What needs to happen, in your opinion, for farmers to adopt environmentally friendly practices? (policies, grants, other changes etc)

End time: _____

APPENDIX 5

Michael Crowley's Story of Sustainability (Farmer 1): Spoken Word and Image Coding

Voice is of Michael Crowley throughout.

Spoken Words	Narrative Code	Images	Image Code
Hi, I'm Michael Crowley, I'm a dairy farmer	Context	1. Photo of Michael sitting down in front of cows	1. Context
from Skibbereen in West Cork.	Place	2. Photo of farm and house	2. Place
I am married to Marguerite and we have five children.	Family	3. Photo of Michael with wife and five children	3. Family
It's a family run farm	Family	4. Photo of Michael with wife, children and grandparents	4. Family
and there are three generations living on the farm.	Generations	5. Upturned wellingtons 6. Family working on farm 7. Michael with daughter	5. Family (Children's boots) 6. Family (Children on farm) 7. Family (Female child)

Today we are milking 150 cows and rearing all our own replacements.	Context	8. Photo of cows	8. Animals
I took over the farm from my parents	Family	9. Michael with cows	9. Animals
20 years ago	History	As above	As above
and now we are preparing for the next generation to take over from us	Generations	10. Michael with his father 11. Michael in milking parlour with his son	10. Family 11. Family
We are involved in the Carbery Greener Dairy project on sustainability.	Programme/ Guidance	12. Photo of Carbery Greener Dairy Farms poster board	12. Programme/ Guidance
That's a word I feared	Fear	13. Michael speaking at farm event	13. Programme/ Guidance
because I thought it would affect our income	Financial implications	As above	As above
or that it would restrict us in farming practices	Fear (of restrictions)	As above	As above
but actually it proved to be the opposite.	Learning	14. Michael at kitchen table reviewing documents	14. Learning

With a bit of guidance,	Learning	15. Teagasc Advisor and storyteller	15. Learning
we improved	Improvements/ Actions/ Practices	16. Photo of Michael in his kitchen with lightbulb graphic,	16. Learning
in a lot of areas, such as soil fertility, grassland management, better milk composition,	Improvements / Actions/ Practices	17. Photo of report	17. Measurement
I saved on electricity and water	Financial implications (savings)	18. Photo of Michael walking the fields 19. Photo of cows being milked	18. Context 19. Animals
Nowadays we are growing more grass,	Improvements/ Actions/ Practices	20. Photo of grass	20. Nature and Biodiversity
we are gone from growing 12 tonne to 15 tonne per year with better varieties,	Measurement	21. Photo of grass (different to above)	21. Nature and biodiversity
receding paddocks that are not pulling their weight, spreading 80% of the slurry in the Spring and applying 2 tonne of lime every 3 years.	Measurement	22. Photo of grass 23. Photo of farm machinery in field 24. Photo of farm machinery in field (different to above)	22. Nature and biodiversity 23. Farm Equipment, Machinery, Operations

			24. Farm Equipment/ Machinery / Operations
We blanket spread the farm with urea in February and March and	Improvements / Actions / Practices	25. Photo of farm machinery	25. Farm Equipment/ Machinery / Operations
follow the cows for the rest of the year after each grazing with CAN or sulpha CAN	Improvements/ Actions / Practices	26. Cows 27. Cows (different to above)	26. Animals 27. Animals
For us sustainability is about passing on	Generations	28. Photo of father with wheel barrow and young child	28. Family
good farming practices	Improvements/ Actions / Practices	As above	As above
from generation to generation	Generations	29. Photo of sons in a tyre swing	29. Family
Since starting this story, my father passed away.	Family	30. Close up photo of Michael's father;	30. Family
He died a proud man	Pride / Achievement / Appreciation	31. Photo of the father walking country road;	31. Family

of what he achieved and what we achieved.	Pride / Achievement / Appreciation	32. Photo of Michael standing as 'champion';	32.Pride / Achievement / Appreciation
We turned poorly drained land into good grassland	Improvement / Actions / Practices	33.Photo of drain dug out 34.Photo of Michael standing in the drain 35.Photo of Michael standing as 'champion'	33.Improvements / Actions / Practices 34.Improvements / Actions / Practices 35.Achievement
but still left some untouched land for the wildlife and the flowers to grow on.	Nature & Biodiversity	36.Grassland 37.Countryside with flowers	36.Nature & Biodiversity 37.Nature & Biodiversity
On the day of his funeral, the grandchildren	Family	38.Grandchildren	38.Family
collected wild flowers	Nature & Biodiversity	As above	As above
from the places he had shown them	Place	As above	As above
to put them into his grave.	Family	As above	As above
His goal in life was to mind his family,	Family	39.Photo of family	39.Family

mind the land,	Care	40.Photo of countryside	40.Nature & Biodiversity
look after nature and	Nature & Biodiversity	As above	As above
I think we can all learn from that.	Learning	41. Photo of flowers 42. Photo of birds 43. Photo of plants 44. Photo of rainbow 45. Photo of sunset	41.Nature & Biodiversity 42.Nature & Biodiversity 43.Nature & Biodiversity 44.Nature & Biodiversity 45.Nature & Biodiversity

APPENDIX 6

Aidan's McCarthy's Story of Sustainability (Farmer 2): Spoken Word and Image Coding

Duration 5.0 minutes

Voice is of Aidan McCarthy throughout.

Spoken Words	Narrative Code	Images	Images Code
Sustainability?	Context	1.Cows	1.Animals
Is what I am doing as a farmer sustainable for the future?	Context	2.Cows	2.Animals
It's an interesting question and while I'm not claiming to know the answer, I can at least give my opinion on it.	Context	3.Photo of two kids in grass	3.Family
My name is Aidan McCarthy,	Context	4.Photo storyteller, wife and children	4.Family

I'm living on a farm with my family	Family	As above	As above
in Schull in West Cork	Place	As above	As above
Since 2012, I've been lucky enough to be part of the Carbery Greener Dairy Programme.	Learning	5.Photo cows in field	5.Animals
When we talk about sustainability or even survival for our farms, I always worry	Fear	6.Photo of daughter with cows	6.Family
about our ability to compete with huge dairy powers like the US and New Zealand, or even countries closer to home like France, Germany or Holland, with their scale and their huge sheds full of cows in the all year around house systems.	Competitiveness	7.Photo tractor in field 8.Photo cows in field 9.Photo of cows in field (different to above)	7.Farm Equipment, Machinery & Operations 8.Animals 9.Animals
But why worry about them? Why don't we concentrate on our own positives instead? Look at what we're doing, look at how we're doing it, look at where we are farming?	Achievement/ Pride /Appreciation	10.Photo of cows 11.Photo of cows by sea	10.Animals 11.Animals
We have so much to be proud of in our system of farming and more so in the product that we are producing.	Achievement / Pride/ Appreciation	As above	As above

We are producing the lowest carbon footprint in milk	Climate Change, Carbon footprint & Emissions	12.Image of carbon efficiency chart	13.Measurement
in the EU, bar none, bar none.	Pride / Achievement / Appreciation	As above	As above
With as little as 6 litres of water, we are producing 1 litre of milk.	Measurement	13.Photo of water in container	13.Measurement
Compare this to some of the countries I mentioned earlier where they are using up to 40 litres of water to produce 1 litre of milk.	Competitiveness	14.Photo of cows	14.Animals
Our cows diet is largely made up from grazing fields of green grass out in the open as nature intended.	Nature & Biodiversity	15.Photo of child looking out window	15.Family
Even when we have to house our cows, we are lucky enough to be able to grow most of their winter feed on our own farms, limiting our exposure to outside markets and products whose prices we can't control	Competitiveness	16.Photo of cows in field 17.Photo tractor in field 18.Photo of son lying in grass	16.Animals 17.Farm Equipment / Machinery / Operations 18.Family

But can we continue to increase our efficiency without harming our environment? Can we even increase our efficiency and improve our environment? Why not?	Improvements / Actions / Practices	19.Photo of two children looking into river 20.Photo of cows	19.Family 20.Animals
From the Greener Dairy Programme,	Programme/ Guidance	21.Photo children with cows crossing road	21.Family
I have learned the simple things	Learning	22.Photo cows	22.Animals
like soil fertility can be greatly improved	Improvements / Actions / Practices	As above	As above
without adding much extra cost to my present system	Financial Implications	As above	As above
For example, if we spread more lime, this will increase the release of nutrients from the soil, which will hugely improve the response of any fertiliser applied and in turn will grow more grass	Improvements / Actions / Practices	22.Photo field with shadow of father and child 23.Two children in milking parlour	22.Family 23.Family
And lime is cheap.	Financial implications	As above	As above
Do you know one tonne of lime costs just 5% or 1/20 th of a tonne of say 27 2 and half five.	Measurement	24.Photo of cows	24.Animals
By soil testing, we can target the fields that actually need more P and K in the form of slurry, instead of	Improvements/ Actions /Practices	25.Photo of cows walking in lane	25.Animals 26.Animals

always going to the same field or the fields that are more convenient to the yard,		26.Photo of cows by the sea	
again saving fertiliser costs.	Financial Implications	27.Photo of cows	27.Animals
By getting more of our slurry out earlier in the year, this will increase its nutrient uptake and lower the losses of nitrogen to volitisation in Summer sunshine.	Improvements/ Actions / Practices	As above 28.Old buildings	As above 28.History
By using a plate cooler, we can greatly reduce the amount of electricity needed to cool milk.	Improvements/ Actions/ Practices	29.Photo of two children	29.Family
This expensive milk cooling seems to be the biggest draw of electricity on most of our farms.	Financial Implications	30.Photo of cows walking down lane	30.Animals
Even using this water from the plate cooler to wash down the parlour and yard after milking and make it available for cows to drink or even use it to feed calves is another form of recycling.	Improvements/Actions / Practices	31.Rainbow 32.Photo son 33.Photo cows drinking	31.Nature & Biodiversity 32.Family 33.Animals
By participating in little projects, like the Carbery Trees or sowing hedges along the fence are	Programmes/ Guidance	34.Photo of two kids with watering cans	34.Family
also a huge benefit to the biodiversity on our farms.	Nature & Biodiversity	As above	As above
Even spraying in the evening, instead of in the midday sun, will help that spray to work better	Improvements/ Actions / Practices	35.Photo cows in field 36.Photo of son	35.Animals 36.Family

and more importantly do very little harm to our bee population.	Nature & biodiversity	As above	As above
We shouldn't be afraid	Fear	37.Photo cows in field	37.Animals
to get involved in GLAS, AOS or similar environmental schemes.	Programmes/ Guidance	As above	As above
Getting paid	Financial Implications	38.Photo cows	38.Animals
to do the right thing environmentally on a farm isn't a bad thing.	Improvements/Actions / practices	As above	As above
We're not trying to change the world, but maybe if we could all do something to improve our own little patch,	Improvements / Actions / Practices	39.Photo of family	39.Family
then collectively, we could all make a big difference	Improvements / Actions/ Practices	40.Photo child by sea	40.Family
for the next generation	Generations	As above	As above

because at the end of the day, it is our family and our kids are what is most important and doing the right thing for the environment is doing the right thing for them.	Family	41.Photo of 3 children having picnic 42.Video of children running in the grass 43.Photo of cows	41.Family 42.Family 43.Animals
None	None	44.Image saying 'Made by the McCarthy Family as part of the Carbery Digital Storytelling Series'	44.Family

APPENDIX 7

John Hurley's Story of Sustainability (farmer 3): Spoken Word and Image Coding

Duration 4.53 minutes

Voice of John Hurley throughout

Words	Narrative Code	Images	Image Code
In 1993 I took over the running of the farm.	History	1. Farm House	1. Place
Over the years, I steadily built in up to where we are today.	Pride/ Achievement/ Appreciation	2. Photo of Farm	2.Place
I am involved in a Teagasc Group and I am also a participant in the Carbery Greener Dairy Farmer Programme.	Programme/ Guidance	3. Photo of discussion group 4. Photo of Carbery Plant	3.Programme/ Guidance 4.Place
These groups have helped me to improve the everyday running of the farm.	Improvements / Actions / Practices	As above	As above
Water is an important commodity for the everyday running of our farm. This is one of the water tanks that we have on our farm.	Context	6.Photo of water troughs 7.Photo of Water tank	6.Farm Equipment, Machinery & Operations

			7.Farm Equipment, Machinery & Operations
This tank doesn't cost anything to run.	Financials Implications	As above	As above
It supplies water to the plate cooler to cool the milk, the water is then recycled to wash the milking parlour and yards.	Improvements/ Actions / Practices	8.Photo of plate cooler 9.Photo of daughter with water hose	8.Farm Equipment, Machinery & Operations 9.Family
Every two years, I get the soil tested for nutrients, phosphorous, potassium and lime.	Measurement	10.Photo of grassland 11.Photo of tractor	10.Nature & Biodiversity 11.Farm Equipment, Machinery & Operations
Healthy soil helps to produce more high quality grass. We ? for six weeks using bulls with good fertility and milk solids.	Improvements/ Actions/ Practices	12.Photo storyteller 13.Photo farmer with cows	12.Context 13.Context
Grass is the cheapest form of feed. Our cows go to grass as soon as they have calved, weather permitting, of course.	Financial Implications	14.Photo of cows in field 15.Photo of calves	14.Animals 15.Animals

We utilise the grass by frequently moving the cows between paddocks turning the grass into lots of high value milk solids at low costs.	Financial Implications	16.Photo of cows in field 17.Photo of storyteller and son 18.Photo of storyteller and son (different to above)	16.Animals 17.Family 18.Family
In early Spring time, when all the tanks are full, I spread slurry on silage ground to make the most of the natural fertiliser that every farmer has plenty of. Slurry is a valuable source of nitrogen, phosphorus and potassium.	Improvements / Actions / Practices	19.Photo of spreading slurry on field 20.Photo of slurry tank	19.Farm Equipment, Machinery & Operations 20.Farm Equipment, Machinery & Operations
It can help control fertiliser costs.	Financial Implications	As above	As above
The effluent from the silage pit flows into channels and enters the slurry tank.	Improvements / Actions / Practices	21.Photo of channels	As above
In early Summer, before the first silage is cut, we dispose of our old silage plastic.	Improvements / Actions / Practices	22.Photo of plastic on slurry pit	22.Farm Equipment, Machinery & Operations

We take it to a recycling point set up by a recycling Scheme.	Programme/ Guidance	23.Photo of plastic on slurry pit (different to above)	23.Farm Equipment, Machinery & Operations
There was a time when plastic was burnt on all farms but that has all changed.	Improvements / Actions / Practices	24.Photos of bags of plastic	24. Farm Equipment, Machinery & Operations
The ban on the burning of plastic	Programme/ Guidance	As above	As above
resulted in an improved environment and farm surroundings.	Improvements / Actions/ Practices	25.Photo of countryside	25.Nature & Biodiversity
Tree planting reduces carbon emissions.	Improvements / Actions / Practices	26.Photo of daughter planting trees	26.Family
Here is my daughter Sinead planting trees supplied by Carbery.	Family	As above	As above
These are some of the sustainable practices	Improvements/ actions / practices	27.Photo of daughter digging hole for tress	27.Family

that we as a family use to run our farm	Family	28.Photo of family	29.Family
All of these practices have helped us to build up our farm to where it is today as well as helping the environment.	Pride / Achievement / Appreciation	As above 29.Photo of farm	As above 29.Place
I hope by using these sustainable practices	Improvements/ Actions / Practices	30.Photo of cows going up lane	30.Animals
it will help us to continue to produce good quality milk	Competitiveness	As above	As above
at a low cost,	Financial Implications	31.Photo of Drinagh Co-op milk lorry	31.Place
be profitable	Profitability	As above	As above
and set an example for the next generation	Generations	32.Photo of children	32.Family

It is possible to work hand and hand with the environment and still succeed and be profitable.	Profitability	33.Photo of countryside 34.Photo of family wellingtons	33.Nature & Biodiversity 34.Family
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APPENDIX 8

James Fitzpatrick's Story of Sustainability (farmer 4): Spoken Word and Image Coding

Duration 3.39 minutes

Voice of James Fitzpatrick throughout.

Spoken Words	Narrative Code	Images	Image Code
Hi my name is James.	Context	1.Photo of storyteller and two kids	1.Family
I am farming in West Cork, just outside of Clonakilty.	Place	As above	As above
The farm has been in my family	Family	2.Photo of house and farm	2.Place
for generations.	Generations	As above	As above
My father passed it on to me	Family	3.Photo of father	3.Family
over 20 years ago.	History	4.Photo of father with grandchildren	4.Family
It is a family run dairy farm	Family	5.Photo of wife and daughter	5.Family

milking cows and rearing replacement stock. The farm is a mix of good land and some wetland.	Context	6.Photo of cows crossing road 7.Photo of storyteller in milking parlour 8.Photo of countryside	6.Animals 7.Farm Equipment, Machinery & Operations 8.Nature & Biodiversity
I joined up with Carbery Greener Farms Project	Programme/ Guidance	9.Photo of grassland	9.Nature & Biodiversity
to monitor our carbon footprint.	Carbon footprint	As above	As above
I was interested to see what our water and electricity usage would be	Measurement	As above	As above
and to look at ways to reduce them.	Improvements / Actions /Practices	As above	As above
All other major farm inputs, such as fertiliser usage, fuels and detergents were measured as well.	Measurement	As above	As above
For over two years, we submitted a monthly report on all our activities and usage	Measurement	As above	As above

and we then got great feedback on this.	Learning	10.Photo of cows	10.Animals
This focused our attention on being as efficient with our water and electricity usage as possible.	Improvements/ Actions / Practices	As above	As above
We would always have been aware of it but this programme really focused us on it.	Programme/ Guidance	11.Photo of storyteller working	11.Context
I was very pleased to discover that we compared favourably to other farms in the project.	Pride, Achievement, Appreciation	12.Photo of grassland 13.Photo of drinking troughs	12.Nature & Biodiversity 13.Farm Equipment, Machinery & Operations
We are using night rate electricity for heating water.	Improvements /Actions /Guidance	14.Photo of house	14.Place
Also our home is heated by a geo-thermal system which is also on night rate and	Improvements /Actions / Practices	15.Photo of daughter	15.Family
is a very efficient way of heating our home.	Improvements/ Actions / Practices	As above	As above
This contributes to our overall energy usage being low.	Improvements/ Actions /Practices	As above	As above
The milk is cooled firstly by a water plate cooler before entering the bultank	Improvements/ Actions / Practices	As above	As above

and the water from this plate cooler is stored for further use washing the milking parlour and yards.	Improvements / Actions / Practices	16.Photo of cows	16.Animals
We also harvest some rainwater for use as drinking water for cattle.	Improvements/ Actions / Practices	As above	As above
Our farms would be rich in natural trees and hedgerows	Nature & Biodiversity	As above	As above
with an abundance of wildlife	Nature & Biodiversity	As above	As above
which we try to farm in harmony with	Care	17.Photo of tree	17.Nature & Biodiversity
We try to leave habitat undisturbed including an area of wetlands	Nature & Biodiversity	18.Photo of other trees	18.Nature & Biodiversity
which is home to a lot of species including pheasants and hares.	Nature & Biodiversity	As above	As above
It is important to try to leave the landscape as undisturbed	Care	As above	As above
for the generations that come after us.	Generations	As above	As above

APPENDIX 9

Cormac O’Keeffe’s Story for Sustainability: Spoken Word and Image Coding

Duration 3.59 minutes

Voice of Cormac O’Keeffe throughout.

Spoken Words	Narrative Code	Images	Image Code
This is the story of our farm.	Context	1.Photo of countryside	1.Nature & Biodiversity
This is me Cormac, with our three children, James, Laoise and Eoghan.	Family	2.Photo of storyteller with children	2.Family
This is my wife Clodagh with our three children and with our two dogs Twinkles and Sprinkles.	Family	3.Photo of wife, children and dogs	3.Family
I received this farm from my father, James,	Family	4.Photo of storyteller, father and son	4.Family
in 2001.	History	As above	As above
We are situated a few miles west of Clonakilty overlooking Inchydoney Bay.	Place	5.Photo of countryside	5.Nature & Biodiversity

We are dairy farmers supplying Lisavaird Co-op. Our milk is processed at Carbery Creameries in Balineen whose flagship product is Dubliner Cheese.	Context	6.Photo of countryside 7.Photo of cows	6.Nature & Biodiversity 7.Animals
The farm goes back five generations.	Generations	As above	As above
My great great grandfather began farming here around 1850.	Family History	8.Photo of old buildings on farm As above	8.History As above
Every generation has faced massive challenges.	Generations	9.Photo of old building	9.History
The challenge facing my generation is climate change,	Climate change / Carbon Footprint & Emissions	10.Photo of old building	10.History
reducing our carbon emissions	Climate change / Carbon Footprint & Emissions	11.Photo of old building	11.History
and to protect our environment.	Improvements/ Actions / Practices	12.Photo of old machinery	12.History
In 2012, I was asked to participate in the Carbery Greener Dairy Farm project.	Programme/ Guidance	As above	As above
This project wanted to assess the sustainability of Carbery suppliers.	Measurement	13.Photo of group at discussion group	13.Programme/ Guidance

Firstly, we have to be economically sustainable.	Financial Implications	14.Photo cows in field	14.Animals
We have double cow numbers and we have increased our protein percentage	Improvements / Actions / Practices	As above	As above
to 3.71 and our fat to 4.3.	Measurement	15.Photo cows in field	15.Animals
This has added great value to our milk.	Profitability	16.Photo of cows	16.Animals
Grazed grass makes up the biggest part of the cows diet.	Nature & Biodiversity	As above	As above
Teagasc have shown us how to grow and utilise more grass.	Learning	17.Photo of cows	17.Animals
We have increased the soil PH and the soil P and K. This allowed us to grow more grass without spreading more chemical nitrogen.	Improvements/ Actions / Practices	As above	As above
We now utilise over 11 tonne of grass per hectare.	Measurement	18.Photo of cows	18.Animals
The cow's calf compactly in February and are let out to grass. They are housed in November before being dried off.	Improvement/ Actions / Practices	As above	As above

This has greatly reduced our concentrate usage	Improvements / Actions / Practices	As above	As above
whilst also reducing our carbon footprint.	Climate change/ Carbon footprint & Emissions	19.Photo of plate cooler	19.Farm equipment & machinery
The research team monitored all the electricity usage on the farm.	Measurement	As above	As above
We have improved the efficiency of our plate cooling system, reducing our ? usage.	Improvements/ Actions / Practices	As above	As above
We reuse this water to wash down the plant after milking.	Improvements / Actions / Practices	20.Photo of cows being milked	20.Animals
We have bred a smaller more efficient cow	Improvements / Actions / Practices	21.Photo of cow	21.Animals
increasing the EBI from 80 to 160.	Measurement	As above	As above
The cows last longer in the herd reducing the need for replacements.	Improvements / Actions / Practices	22.Photo of cows in field	22.Animals
This has also reduced our carbon footprint.	Climate change /Carbon footprint & Emissions	As above	As above

We have laid over 2km of roadway on the farm. To offset the environmental impact of this, we began planting hedging along these roadways.	Improvements/Actions / Practices	23.Photo of roadway and dogs 24.Photo of roadway and dogs (different to above)	23.Family 24.Family
To date we have 3,500 whitethorn plants.	Nature & Biodiversity	25.Photo of roadway (different to above)	26.Context
In 2014, as part of the Carbery Greener Dairy Farm project,	Programme / Guidance	26.Photo of dog in stream in countryside	26.Nature & Biodiversity
Hannah Dineen visited the farm to assess	Measurement	As above	As above
the biodiversity on the farm.	Nature & Biodiversity	As above	As above
She told me that	Learning	27.Photo of countryside and dog	27.Nature & Biodiversity
the streams and boirin's that meander through the farm were natural havens for birds, insects and flora and fauna.	Nature & Biodiversity	28.Photo of countryside and dogs	28.Nature & Biodiversity
We have fenced off these areas and given them back to nature.	Improvements/ Actions / Practices	As above	As above

10% of our farm is now habitat.	Pride / Achievement / Appreciation	29.Photo of countryside	29.Nature & Biodiversity
We also try to recycle as much as we can, recycling now all our farm plastics.	Improvements/ Actions / Practices	30.Photos of plastic in trailer	30.Farm Equipment/ Machinery & Operations
This has reduced our carbon footprint.	Climate change/ Carbon footprint & Emissions	31.Photo of son, cows and dogs	31.Family
I hope my story has shown how a commercial dairy farmer is doing what he can to help the environment.	Improvements/ Actions/ Practices	32.Photo of son (different to above)	32.Family
I hope that our actions	Improvements/ Actions /Practices	As above	As above
will protect the farm	Improvements/ Actions / Practices	33.Photo of cows leaning over wall	33.Context
for future generations.	Generations	As above	As above
Go raibh mile maith agat.	Context	As above	As above

APPENDIX 10

Tim O'Mahony's Story for Sustainability: Spoken Word and Image Coding

Tim O'Mahony

Duration 4.01 minutes

Voice of Tim O'Mahony throughout.

Words	Narrative Code	Images	Image Code
My name is Tim O'Mahony	Context	1.Video of countryside with frame saying 'A production by Time, Catherine and Family' 2.Video of bee buzzing in countryside	1.Family 2.Nature & Biodiversity
and I am farming here with my wife and family	Family	3.Photo of sign for Schull 4.Photo of flowers	3.Place 4.Nature & Biodiversity

on the Mizen peninsula.	Place	5.Signpost for Schull (different to above)	5.Place
I have always been interested in nature and the surrounding environment	Nature & Biodiversity	As above	As above
and as a farmer, I see myself as a custodian of the countryside.	Care	6.Photo of car going down street in car 7.Photo of countryside	6.Place 7.Nature & Biodiversity
As someone with a real passion for farming, I have the unique opportunity to produce milk in one of the most beautiful and natural landscape anywhere in the world.	Pride / Achievement / Appreciation	As above 8.Photo of cow at sunset 9.Photo of countryside at sunset	As above 8.Nature & Biodiversity 9.Nature & Biodiversity
Our farm has a unique setting	Pride / Achievement / Appreciation	10.Photo of countryside	10.Nature & Biodiversity
as it has the Atlantic Ocean on three sides within 1km which makes for a temperate climate due to its proximity to the Atlantic Ocean and the presence of	Place	11.Photo of sea 12.Photo of bridge 13.Photo of sea	11.Nature & Biodiversity 12.Place

the Gulf Stream which brings lots of rainfall and lends itself to the lush green pastures that you see all over West Cork.		14.Photo of houses by the sea 15.Photo of countryside	13.Nature & Biodiversity 14.Nature & Biodiversity 15.Nature & Biodiversity
As the soil temperature seldom goes below 6 degrees Celsius, we can grow grass all year round.	Nature & Biodiversity	16.Photo of countryside (different to above) 17.Photo of cows	16.Nature & Biodiversity 17.Animals
We have been involved in the Carbery Greener Dairy Farms over the last number of years	Programme/ Guidance	18.Photo of cow (different to above)	18.Animals
and we have had our farm fitted with smart meters on the water and electricity. We have five meters on the water and electricity use is divided up as well.	Measurement	As above 19.Photo of cows	As above 19.Animals
With the water meters, we have been able to detect water leaks	Measurement	20.Photo of cows	20.Animals

and fix them accordingly.	Improvements/ Actions /Practices	Photo re-used from previous	As across
This action has a very positive environmental impact as well as financial.	Financial Implications	21.Photo of Drinagh Co-op milk lorry	21.Place
Our energy costs have decreased since I joined the project,	Financial Implications	22.Photo of dog	22.Family (pet)
from 0.6 cent per litre to 0.51 per litre	Measurement	23.Photo of cat	23.Family (pet)
and the energy used per litre of milk from 37 watt hours per litre to 31 watt hours by litre.	Measurement	24.Photo of horse 25.Photo of cows 26.Photo of landscape	24.Family 25.Animals 26.Nature& Biodiversity
This is mainly done by improvements in cooling efficiency	Improvements/ Actions / Practices	27.Photo of road leading to sea	27.Nature & Biodiversity
from 129 litres to 140 litres of milk cooled per unit of electricity.	Measurement	As above 28.Photo of boat on sea	As above 28.Nature & Biodiversity
Our carbon footprint in 2015	Climate change, carbon footprint & emissions	29.Photo of sunset	29.Nature & Biodiversity
was 1.1 kg CO ₂ per Kg Energy Corrected milk.	Measurement	As above	As above

Hope you enjoy our video, thank you.	Context	30.Photo of sunset (different to above)	30.Nature & Biodiversity
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APPENDIX 11

Darragh Kennedy's Story for Sustainability: Spoken Word and Image Coding

Duration 5.01 minutes

Voice of Darragh Kennedy throughout.

Words	Narrative Code	Images	Image Code
Hi my name is Darragh Kennedy and I manage a 100 cow calving herd	Context	1.Video of Darragh speaking to camera in field with cows	1.Context
just outside Reenacreena in West Cork for Lisavaird Co-op	Place	As above	As above
and this is our digital story.	Context	As above	As above
Our sustainability story begins here with the process of cows converting grass into milk.	Context	2.Video of cows munching on grass	2.Animals
We are really lucky here in West Cork as we have the ideal climate for growing lots of grass.	Pride / Achievement / Appreciation	As above	As above
Because this is a company owned farm, economic sustainability has always been the	Profitability	3.Photo of Lisavaird Co-op	3.Place

main priority in what we do, whilst environmental sustainability has always been a consideration,		4.Image of €1 coin	4.Financial Implications
REP4 which we joined in 2009 moved in more sharply into focus.	Programme/ Guidance	5.Photo of REPS plan 6.Image of tree	5.Programme/ Guidance 6.Nature & Biodiversity
Planting trees and hedgerows, creating wildlife corridors and putting up bird boxes	Nature & Biodiversity	7.Photo of countryside	7.Nature & Biodiversity
were a few measures that we undertook.	Improvements/ Actions / Practices	8.Photo of stream in countryside	8.Nature & Biodiversity
About 8% of our farm would be classed as wildlife habitat	Nature & Biodiversity	9.Photo of branches 10.Photo of countryside	9.Nature & Biodiversity 10.Nature & Biodiversity
but the extra REPS measures	Programme/ Guidance	11.Photo of grassland	11.Nature & Biodiversity

didn't require us to take any productive ground out of the system and	Improvements/ Actions/ Practices	12.Image of winning cup	12.Pride/ Achievement / Appreciation
we were being paid to do it.	Financial Implications (payment)	As above	As above
It was win-win.	Pride / Achievement / Appreciation	As above	As above
The nitrates directive also started to bite around the same time so we all had to sit up and pay a bit more attention to what we were doing and how we were doing it and what potential effects our farming systems were having on our environment.	Programme/ Guidance	13.Photo of directive 14.Photo of meters 15.Photo of cows	13.Programme / Guidance 14.Measurement 15.Animals
You could almost say that we became environmentally aware by default.	Programme / Guidance	As above	As above
Leading on from that, Carbery initiated the Carbery Greener Dairy Programme in 2012 to, in conjunction with Teagasc,	Programme / Guidance	16.Photo government ministers and Carbery personnel	16.Programme/ Guidance

gather information on all inputs into our businesses, be they power, feed, fuel, fertiliser, contractor costs, in fact, anything we were doing	Measurement	17.Photo of Sign saying participant in Carbery programme 18.Photo of energy and water usage graphs	17.Programme/ Guidance 18.Measurement
that would have an impact on our carbon footprint.	Climate change/ Carbon footprint & emissions	19.Photo of meter	19.Measurement
Membership of this group gave us access to Teagasc researchers and ongoing trial work	Learning	20.Photo of Teagasc logo	20.Programme/ Guidance
which gave us the confidence to implement changes on the farm	Improvements/ Actions/ Practices	As above	As above
based on gathered data.	Measurement	As above	As above
Understanding	Learning	21.Image of Euro	21.Financial Implications
and acting	Improvements/ Actions / practices	22.Image of Euro	22.Financial Implications

on soil fertility analysis, Teagasc's cost control planner, grass measuring and budgeting and understanding and using ICBF's herd plus	Measurement	23.Photo of measuring equipment 24.Photo of ICBF Report	23.Measurement 24.Programme/ Guidance
have all led to improve profitability.	Profitability	As above 25.Logo of ICBF	As above 25.Programme/ Guidance
Regular soil sampling in conjunction	Measurement	26.Photo of soil samples	26.Measurement
with understanding	Learning	As above	As above
and acting on the results	Improvements/ Actions/ Practices	As above	As above
has shown the biggest financial return.	Financial Implications	27.Photo of soil analysis report from Teagasc	27.Measurement
Being on top of what my soil actually needs has allowed me to grow more grass for the same fertiliser usage	Improvements/ Actions / Practices	As above 28.Photo of grassland	As above 28.Nature & biodiversity

This combined with a planned reseeding programme,	Improvements/ Actions / Practices	As above	As above
I believe, has the greatest potential to increase profits on this farm in an environmentally friendly way.	Profitability	29.Image of Euro	29.Financial Implications
Regular soil sampling is effectively giving an EBI to each plot of ground	Measurement	30.Photo of cows	30.Animals
and we all know what EBI has done for our cows.	Learning	As above	As above
Economic and environmental sustainability are inextricably linked and are in no way mutually exclusive, I believe you can't have one without the other.	Overarching view of sustainability	31.Image of Euro in Green map of Ireland 32.Image of Euro coins with green tree	31.Financial Implications (Cost savings) 32.Financial Implications (Cost savings)
As a company farm, our first priority is to earn profits for our owners	Profitability	33.Photo of farm	33.Place
but however, this is where we live and have raised our family.	Family	34.Photo of daughter	34.Family

Unlike your typical family farm , this will not be passed down to the next generation,	Generations	35.Photo of daughter (different to above)	35.Family
its future depends on its profitability	Profitability	As above	As above
but we also have a duty of care	Care	36.Photo of farm	36.Place
to the place that we do business and to the locality.	Place	As above	As above
We will continue to try to implement best practice	Improvements/ Actions / Practices	37.Photo of Mission Statement	37.Improvements/ Actions / Practices
to ensure that we keep both economic and environmental sustainability our primary focus.	Financial Implications	As above	As above
We believe so strongly in the concept of overall sustainability that we have integrated it into our farm mission statement.	Pride / Achievement / Appreciation	38.Video of cows eating grass	38.Animals
As the American author and scientist Edward Wilson said “the great challenge of the 21 st century is to raise people everywhere to a decent standard of living whilst preserving as much of the rest of life as possible”.	Overarching view of sustainability (quote on human rights and preservation)	As above	As above

APPENDIX 12

John Joe O'Sullivan's Story for Sustainability: Spoken Word and Image Coding

Duration 5.01 minutes

Voice of John Joe O'Sullivan throughout.

Spoken Words	Narrative Code	Images	Image Code
My name is John Joe O'Sullivan	Context	1.Video of storyteller speaking to camera	1.Context
and I come from the land of milk and honey.	Pride	As above	As above
I reside with my wife Teresa and family	Family	2.Video of milk, spoon in honey. 3. Photo of farm and buildings from 1998	2.Food produce 3. History
at Gurrane, Rosscarbery.	Place	As above	As above
From a young age, I had a very keen interest in farming and I am thankful	Appreciation	4.Video of storyteller milking 5. and video of cows 2016	4.Improvements/ Actions/ Practices 5.Animals
to have inherited the family farm from my parents.	Family	As above	As above

At that time, the strongest horse power on the farm was two horses.	Generations (Changing times)	6.Video of horse	Family
It was then cattle, sheep and pigs. We started dairy farming in 1975. All female calves were and still are kept as replacements and reared on the farm.	History	7.Photo of sheep 8.Video of calves wagging tails 9.Photo of cows	7.Animals 8.Animals 9.Animals
My son Andrew presently works with me also.	Family	8.Video of son driving tractor	8.Family
Weather here is not always dry and sunny.	Context	9.Video of rain	9.Nature & Biodiversity
The Irish climate gives us plenty of moisture to keep the grass growing for the cows.	Nature & Biodiversity	10.Photo of snow in fields 11.Photo child in lane 12.Video cow eating grass	10.Nature & Biodiversity 11.Family 12.Animals

Having such a rich pasture based platform means we can keep the amount of imported concentrates to the cow's diet to a minimum.	Nature & Biodiversity	13.Video tractor in field 14.Video of Lisavard Co-op milk lorry	13.Farm equipment & machinery 14.Place
In 2004 we joined REPS,	Programme / Guidance	15.Video of cows eating	15.Animals
which encouraged us to introduce some clover into the ?.	Improvements/ Actions / Practices	16.Video of grass and clover	16.Nature & Biodiversity
It requires little more management than grass only.	Improvements/ Actions / Practices	As above	As above
Clover is a soil conditioner and reduces the amount of artificial nitrogen we need to spread.	Improvements/ Actions/ Practices	17.Video of machine spreading on fields	17.Farm equipment & machinery
It gives rise to the protein content in the milk and	Improvements/ Actions / Practices	18.Video of clover in blossom	18.Nature & Biodiversity
when in blossom provides an abundance of nectar for the bees.	Nature & Biodiversity	19.Photo of bee on clover	19.Nature & Biodiversity

The Carbery Dairy Greener project	Programme/ Guidance	20.Photo habitat map report	20.Measurement
undertook a biodiversity study	Nature & Biodiversity	As above	As above
on all participating farms which revealed an incredible average of 12% habitat areas throughout.	Measurement	21.Video of countryside As above	21.Nature & Biodiversity As above
This extensive landscape highlights the unique setting we have for our system of milk production.	Pride / Achievement / Appreciation	22.Photo of nests in trees 23.Video of hare in countryside	22.Nature & Biodiversity 23.Nature & Biodiversity
Any existing ditches or hedgerows that require alterations or removal in line with farm expansion	Nature & Biodiversity	24.Video of ditches and trees planted	24.Nature & Biodiversity
are replaced elsewhere on the farm.	Improvements/ Actions/ Practices	As above	As above
My hobby as a bee keeper has also kept me in connection with nature	Nature & Biodiversity	25.Video of storyteller in bee-keeping suit with hives	25.Nature & Biodiversity

and drives home the importance of our ditches, hedges and trees.	Nature & Biodiversity	26.Video of trees and birds singing	26.Nature & Biodiversity
The beautiful green, white and gold species	Pride / Achievement / Appreciation	As above	As above
of wild flora that have been around for centuries,	Generations	27.Video of flowers growing in countryside	27.Nature & Biodiversity
giving food and cover for wildlife,	Nature & Biodiversity	As above	As above
are too often lost to the misuse of herbicides and pesticides.	Improvements/ Actions / Practices	As above	As above
We time spraying carefully to ensure	Improvements / Actions / Practices	28.Video butterfly, sprayer, flowers growing	28.Nature & Biodiversity
any flora or blossoms are not contaminated.	Nature & biodiversity	As above	As above

No-one wants these toxins entering the food chain, be it through plant, dairy, meat or honey.	Care	29.Video of grass 30.Cheese being produced 31.Honey at the kitchen table	29.Nature & Biodiversity 30.Context 31.Context 31.Context
Bee's will travel great distance in order to get their pollen or nectar.	Nature & Biodiversity	32.Video of storyteller pointing at bees in flowers	32.Nature & Biodiversity
Here a bee is gathering some pollen from an apple tree. To make one teaspoon of honey, the average hive, the number of bees mile trips they must make to a hive is the equivalent of one bee to fly all the way around the equator. We are trying to make it a little easier for them here.	Nature & Biodiversity	33.Video bee gathering pollen from apple tree 34.Video bees in hive 35.Video blossom on tree	33.Nature & Biodiversity 34.Nature & Biodiversity 35.Nature & Biodiversity
Our aim is to produce high quality milk and	Competitiveness	36.Video countryside	36.Nature & Biodiversity

we believe we can do this without having to cost the earth.	Care	37.Video storyteller walking with cows 38.Video cows eating 39.Photo sunset	36.Context 37.Animals 38.Animals 39.Nature & Biodiversity
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APPENDIX 13

Donal O' Connor's Story for Sustainability: Spoken Word and Image Coding

Duration 3.42 minutes

Voice of Donal O'Connor throughout.

Spoken Words	Narrative Code	Images	Image Code
This is the story of water on our farm. The journey begins here at the farm well	Context	1.Photo of river in countryside	1.Nature & Biodiversity
which was dug by hand over 40 years ago	History	2.Photo of well	2.Context
It is only 2 metres deep and each year the well supplies almost $\frac{3}{4}$ of a million gallons of water to the farm. The water is consistently of good quality and is tested annually.	Measurement	3.Photo of countryside 4.Photo grassland 5.Photo cows in field	3.Nature & Biodiversity 4.Nature & Biodiversity 5.Animals
At the beginning of the Greener Dairy Project,	Programme/ Guidance	As above	As above
we set out to use water more efficiently and	Improvements / Actions / Practices	As above	As above

we have put a system in place to get the maximum usage out of each drop of water that is pumped from this well.	Improvements / Actions / Practices	As above	As above
In some cases, water is collected and re-used three times.	Improvements / Actions / Practices	As above	As above
The water is pumped to the storage tank which holds 2,700 gallons	Measurement	6.Photo storage tank	6.Farm equipment & machinery
and this in turn is pumped by a high volume pump in the milking parlour.	Context	7.Photo of pump	7.Farm equipment & machinery
This in turn is used to drive the backing gate during milking.	Improvements / Actions / Practices	8.Video of backing gate and cows	8.Animals
It also circulates the water through the plate cooler.	Improvements / Actions / Practices	9.Photo of plate cooler	9. Improvements / Actions / Practices
The warm water from the plate cooler is in turn stored in this stainless steel tank where it is pumped out to drinking troughs in the field and also to wash down the parlour after drinking.	Improvements / Actions / Practices	10.Photo of tank 11.Photo of cow drinking from trough 12.Video of son in milking parlour	10.Farm equipment & machinery 11.Animals 12.Family

This soiled water then drains into the dirty water tank which has 3 settlement chambers and it is pumped out to the moving sprinkler in the field.	Improvements / Actions / Practices	13.Photo son working in yard 14.Photo sprinkler in field	13.Family 14.Farm Equipment, Machinery, Operations
This soiled water is used to wash down the yard after milking.	Improvements / Actions / Practices	15.Video son washing yard	15.Family
Up to 1,000 gallons of water can be used	Measurement	As above	As above
in this way to clean the yard and it all ends up back in the same tank. So in effect, the water that leaves the well, has three uses before it reaches its final destination being sprinkled on the field.	Improvements / Actions / Practices	16.Photo of tractor and pipework 17.Video of sprinkler working in field	16.Farm equipment & machinery 17.Farm equipment & machinery
Carrying with it valuable nutrients to make the grass grow.	Improvements / Actions / Practices	As above	As above
Four years ago when we first joined the Carbery Greener Dairy Group,	Programme / Guidance	18.Video of cows	18.Animals

we were using seven litres of water per litre of milk produced.	Measurement	As above	As above
Since then, we have put in a new drinking trough system for the cows	Improvements / Actions / Practices	As above	As above
plus a tank to recover to the plate cooler water,	Improvements / Actions / Practices	As above	As above
so last year, our water usage was back to 5 litres per litre of milk produced.	Measurement	19.Photo of cows 20.Photo of cows (different to above)	19.Animals 20.Animals

APPENDIX 14

Sam Kingston's Story for Sustainability: Spoken Word and Image Coding

Duration 5.09 minutes

Voice of Sam Kingston throughout.

Words	Narrative Code	Images	Image Code
Hi my name is Sam. I am speaking today about water sustainability and how we are dealing with it on our farm.	Context	1.Countryside 2.Countryside (different to above) 3.Countryside (different to above)	1.Nature & biodiversity 2.Nature & biodiversity 3.Nature & biodiversity
We live in a high rainfall part of Ireland in West Cork where previous rainfall averages vary between 1,000 to 1250 mm but now it seems we are going to exceed that in over the Winter period alone.	Place	4.Countryside 5.Countryside (different to above) 6.Lake 7.Lake	4.Nature & Biodiversity 5.Nature & Biodiversity 6.Nature & Biodiversity 7.Nature & Biodiversity

We also have a lake on our farm which fisheries people tell me is rich in brown trout.	Context	8.Lake	8.Nature & Biodiversity
One would think water is not an issue for us but water is and will be in the future.	Overarching view of sustainability	9.Countryside 10.Lake	9.Nature & Biodiversity 10.Nature & Biodiversity
Water is a finite resource in that no more fresh water can be resourced.	Resources	As above 11.Cows lying in field	As above 11.Animals
Here's a few interesting facts on water; 97% of earth's water is salty, the rest is trapped in glaciers or underground which means that only 0.03% is available in lakes and rivers etc. as fresh water. Agriculture uses 70% of the world's fresh water supply. An inch of water over an acre totals over 27,000 gallons or 113 tonnes.	Measurement	12.Image saying 'did you know?' 13.Cartoon character in glaciers 14.Sea and ice caps 15.Image of world being held in hand	12.Context 13.Overarching view 14.Overarching view 15.Overarching view

Sustainability and what does it mean?	Context	16.Image 3 interlocking circles of sustainability	16.Overarching view of sustainability
It basically means the ability to endure and be successful over time	Overarching view	17.Image of recycling	17.Overarching view of sustainability
Increasingly in recent years, global food companies and consumers want to know that their food ingredients are produced using responsible farming practices at producer level.	Competitiveness	18.Photo of Carbery Food Plant 19.Photo of cheese and milk products	18.Place 19.Food Produce
As stewards of the land,	Care	20.Photo of cow	20.Animals
we as farmers have a unique opportunity to conserve water and reduce on farm waste through leakage etc.	Improvements/ Actions / Practices	21.Photo of water falling on hand	21.Context
Also by recycling water and rainwater as much as possible.	Improvements/ Actions /Practices	22.Photo water pipe	22.Farm equipment and machinery

A lot of water is used in the milking process. Efficient uses for milk cooling, plate washing, yard washing can add up to significant savings of water.	Improvements/ Actions/ Practices	23.Photo of cows lying in field 24.Photo of milking parlour	23.Animals 24.Farm equipment & machinery
Plate cooling should use 2-3 times the volume of water to milk and a x valve fitted to the plate cooling and linked to milk pump to avoid unnecessary use or waste of water.	Improvements/ Actions/ Practices	25.Photo of plate cooler 26.Photo of valves 27.Photo of meters	25.Farm equipment & machinery 26.Farm equipment & machinery 27.Measurement
In our case, water from plate cooler from plant washing by means of an overhead tank, an overflow goes to yard washing storage tanks so little goes to waste even when peak supply of milk.	Improvements/ Actions / Practices	28.Photo of tank 29.Photo of water overflowing 30.Photo of heat exchanger	28.Farm equipment & machinery 29.Farm equipment & machinery 30.Farm equipment & machinery

We also have a heat exchanger unit in which milk cooling brings water temperature to 55 degrees without any loss of efficiency.	Improvements / Actions / Practices	31.Photo of heat exchanger	31.Farm equipment & machinery
One of the better things we did on our farm, was to put in a water manifold in which water comes directly from pump and is distributed through a central location	Improvements/ Actions / Practices	32.Photo of water manifold	32.Farm equipment & machinery
A series of control valves on the manifold that serve different locations on the farm.	Improvements / Actions / Practices	33.Photo of control valves 34.Photo of milking parlour	33.Farm equipment & machinery 34.Farm equipment & machinery
By fitting meters on the valves we are able to see water use and that has enables us to monitor usage and to detect leaks.	Measurement	35.Photo gauges 36.Photo water valve handles	35.Farm equipment & machinery 36.Farm equipment & machinery

We were very surprised by the amount of underground leaks from old brass joints going undetected.	Learning	37.Cartoon character of workman	38.Improvements/ Actions / Practices
Also, the system allows us to shut off different parts of the farm or farmyard when not in use.	Improvements/ Actions / Practices	38.Cartoon character turning off water	38.Improvements/ actions / Practices
Also on our farm, we have a reed bed system which was established 15 years ago. It basically is two acres of wetlands divided into 5 individual plots which water flows from one to the other. It takes run-off from roadways, yards, etc and by retaining this over a period of time, the reeds do their magic and dirty water is purified.	Improvements / Actions / Practices	39.Photo of reed bed 40.Photo of reed bed 41.Photo roadway 42.Photo water hose	39.Improvements/ Actions / Practices 40.Improvements/ Actions / Practices 41.Context 42.Improvements / Actions / Practices
Lastly it took 4.4 litres of on farm water to produce a litre of milk on this farm in 2015	Measurement	43.Image energy and water consumption	43.Measurement

APPENDIX 15:

Detailed results of questions on Attitudes for the Wider Group of Farmers and the Story-Makers Group.

ATTITUDES

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Attitudes of Wider Group of Farmers

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
In general, implementing environmental practices is too expensive	4.23% 8	13.23% 25	17.99% 34	20.63% 39	17.99% 34	15.34% 29	10.58% 20	189	4.23
In general, implementing environmental practices is worth it in the long run	30.16% 57	43.39% 82	15.34% 29	5.82% 11	2.12% 4	1.59% 3	1.59% 3	189	2.17
In making a decision to implement an environmentally friendly	11.11% 21	11.64% 22	23.28% 44	26.46% 50	7.94% 15	12.17% 23	7.41% 14	189	3.75

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
practice, the cost is more important than the environment									
Some environmental changes are essential regardless of money, time and bureaucracy	35.45 % 67	34.39% 65	13.23% 25	10.05% 19	2.12% 4	1.59% 3	3.17% 6	189	2.26
It is important for me to gain a better understanding of environmentally friendly practices on my farm	41.27 % 78	32.28% 61	14.29% 27	6.35% 12	2.65% 5	1.59% 3	1.59% 3	189	2.08
I am interested in implementing good environmental practices because it will ultimately lead to greater	29.10 % 55	30.16% 57	17.46% 33	10.58% 20	6.35% 12	4.76% 9	1.59% 3	189	2.56

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
opportunities for grants and other supports									

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Attitudes of Story-Makers

Statement	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
In general, implementing environmental practices is too expensive	10.00 % 1	0.00% 0	20.00% 2	0.00% 0	20.00% 2	30.00% 3	20.00 % 2	10	4.90
In general, implementing environmental practices is worth it in the long run	20.00 % 2	0.00% 0	30.00% 3	10.00% 1	20.00% 2	20.00% 2	0.00% 0	10	3.70
In making a decision to implement an	0.00% 0	10.00% 1	20.00% 2	10.00% 1	10.00% 1	50.00% 5	0.00% 0	10	4.70

Statement	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
environmentally friendly practice, the cost is more important than the environment									
Some environmental changes are essential regardless of money, time and bureaucracy	50.00 % 5	30.00% 3	10.00% 1	0.00% 0	0.00% 0	10.00% 1	0.00% 0	10	2.00
It is important for me to gain a better understanding of environmentally friendly practices on my farm	40.00 % 4	30.00% 3	20.00% 2	0.00% 0	10.00% 1	0.00% 0	0.00% 0	10	2.10

Statement	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
I am interested in implementing good environmental practices because it will ultimately lead to greater opportunities for grants and other supports	0.00% 0	10.00% 1	20.00% 2	10.00% 1	10.00% 1	30.00% 3	20.00% 2	10	4.90

APPENDIX 16:

Detailed results of questions on Decision Making for the Wider Group of Farmers and the Story-Makers Group.

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Decision Making of Wider Group

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
I would be influenced to implement environmentally good practices on my farm if Carbery Group/the Co-op think it's important	30.16% 57	35.45% 67	21.69% 41	3.70% 7	2.65% 5	4.23% 8	2.12% 4	189	2.34
Implementing environmental	37.04% 70	37.57% 71	14.81% 28	5.29% 10	3.17% 6	0.53% 1	1.59% 3	189	2.08

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
good practice is important to me personally									
I am interested in good environmental practices because there is a huge opportunity in green marketing of milk products	46.03% 87	30.69% 58	11.64% 22	5.82% 11	2.65% 5	2.12% 4	1.06% 2	189	1.99

Table 9 provides the reader of the responses to the same questions from the story-makers.

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Decision Making of Story-Makers

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
I would be influenced to implement environmentally good practices on my farm if Carbery Group/the Co-op think it's important	0.00% 0	20.00% 2	0.00% 0	0.00% 0	40.00% 4	10.00% 1	30.00% 3	10	5.10
Implementing environmental good practice is important to me personally	50.00% 5	40.00% 4	10.00% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10	1.60
I am interested in good environmental practices because there is a huge opportunity in green marketing of milk products	50.00% 5	30.00% 3	0.00% 0	0.00% 0	0.00% 0	20.00% 2	0.00% 0	10	2.30

APPENDIX 17:

Detailed results of questions on Knowledge for the Wider Group of Farmers and the Story-Makers Group.

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Responses of Wider Group of Farmers in relation to Knowledge

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
I have the knowledge to adopt pro-environmental practices on my farm, if I so wished	16.93% 32	26.46% 50	27.51% 52	17.46% 33	7.94% 15	2.12% 4	1.59% 3	18 9	2.86
If I wanted to, I could adopt environmentally-friendly practices on my farm relatively easily	13.76% 26	21.16% 40	32.80% 62	21.69% 41	5.82% 11	2.65% 5	2.12% 4	18 9	3.01

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Responses of Story-Makers in relation to Knowledge

STATEMENT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
I have the knowledge to adopt pro-environmental practices on my farm, if I so wished	70.00% 7	30.00 % 3	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10	1.30
If I wanted to, I could adopt environmentally-friendly practices on my farm relatively easily	30.00% 3	30.00 % 3	30.00 % 3	10.00 % 1	0.00% 0	0.00% 0	0.00% 0	10	2.20

APPENDIX 18:

Detailed results of questions on Personal Moral Norms for the Wider Group of Farmers and the Story-Makers Group.

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Responses from Wider Group in relation to Moral Norms

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
Implementing environmentally-friendly practices on my farm will help safeguard the farm for future generations	31.22% 59	35.45% 67	22.22% 42	5.29% 10	2.12% 4	2.65% 5	1.06% 2	189	2.24
Implementing environmentally-friendly practices on my farm will have a positive impact on	38.62% 73	35.45% 67	14.81% 28	7.41% 14	1.06% 2	2.12% 4	0.53% 1	189	2.05

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
nature including animals and birds									
I have an emotional commitment to this farm and taking care of the environment is part of that	39.15% 74	36.51% 69	15.87% 30	4.76% 9	2.12% 4	0.00% 0	1.59% 3	189	2.01
I believe that implementing environmental good practice and green production is a more sustainable approach	34.92% 66	36.51% 69	15.34% 29	6.88% 13	3.70% 7	1.06% 2	1.59% 3	189	2.17

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Responses from Story-Makers in relation to Personal Decision-Making

STATEMENT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
Implementing environmentally-friendly practices on my farm will help safeguard the farm for future generations	40.00% 4	40.00% 4	10.00% 1	0.00% 0	0.00% 0	0.00% 0	10.00% 1	10	2.20
Implementing environmentally-friendly practices on my farm will have a positive impact on nature including animals and birds	80.00% 8	20.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10	1.20
I have an emotional commitment to this	50.00% 5	30.00% 3	10.00% 1	10.00% 1	0.00% 0	0.00% 0	0.00% 0	10	1.80

STATEMENT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
farm and taking care of the environment is part of that									
I believe that implementing environmental good practice and green production is a more sustainable approach	40.00% 4	40.00% 4	10.00% 1	0.00% 0	10.00% 1	0.00% 0	0.00% 0	10	2.00

APPENDIX 19:

Detailed results of questions on Community Contexts for Farmers' Decisions for the Wider Group of Farmers and the Story-Makers Group.

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Wider Group Responses to Community Context Questions

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
Good environmental practice is good for my local community	36.51% 69	37.04% 70	16.93% 32	5.82% 11	0.53% 1	0.53% 1	2.65% 5	189	2.09
Implementing environmentally-friendly practices sets a good example for my family	47.09% 89	32.80% 62	12.70% 24	4.76% 9	0.00% 0	1.59% 3	1.06% 2	189	1.87
Implementing environmentally-	37.04% 70	33.33% 63	17.46% 33	6.88% 13	2.65% 5	0.53% 1	2.12% 4	189	2.15

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
friendly practices sets a good example for other farmers									

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Story-Makers Responses to Community Context Questions

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
Good environmental practice is good for my local community	70.00% 7	20.00% 2	10.00% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10	1.40
Implementing environmentally-	70.00% 7	20.00% 2	10.00% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10	1.40

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
friendly practices sets a good example for my family									
Implementing environmentally- friendly practices sets a good example for other farmers	60.00% 6	30.00% 3	10.00% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10	1.50

APPENDIX 20:

Detailed results of questions on Self Identity for the Wider Group of Farmers and the Story-Makers Group.

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Responses from Wider Group of Farmers in relation to Self Identity

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
As a farmer, I believe myself to be an environmental advocate or leader	12.77% 24	26.60% 50	22.34% 42	25.00% 47	8.51% 16	3.19% 6	1.60% 3	188	3.06
I feel more energised and satisfied when I know that I am doing something	22.34% 42	36.70% 69	23.40% 44	10.64% 20	4.26% 8	1.06% 2	1.60% 3	188	2.47

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
good for the environment									
As a farmer, my main role is to produce food in an efficient way	55.32% 104	29.79% 56	6.91% 13	3.19% 6	1.06% 2	1.60% 3	2.13% 4	188	1.78
As a farmer, my main role is to protect the environment	21.81% 41	23.40% 44	27.66% 52	16.49% 31	7.45% 14	2.13% 4	1.06% 2	188	2.75

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Responses of Story-Makers to Questions of Motivation

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
As a farmer, I believe myself to be an environmental advocate or leader	0.00% 0	30.00% 3	30.00% 3	30.00% 3	10.00% 1	0.00% 0	0.00% 0	10	3.20
I feel more energised and satisfied when I know that I am doing something good for the environment	30.00% 3	40.00% 4	20.00% 2	10.00% 1	0.00% 0	0.00% 0	0.00% 0	10	2.10

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
As a farmer, my main role is to produce food in an efficient way	70.00% 7	30.00% 3	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10	1.30
As a farmer, my main role is to protect the environment	40.00% 4	20.00% 2	20.00% 2	10.00% 1	0.00% 0	10.00% 1	0.00% 0	10	2.40

APPENDIX 21:

Detailed results of questions on the Role Farmers Play in Rural Ireland for the Wider Group of Farmers and the Story-Makers Group.

This next section focuses on the role farmers play in rural Ireland.

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Role Farmers Play in Rural Ireland: Wider Group of Farmers

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
Most farmers are taking on environmental practices on their farms	11.70% 22	22.34% 42	26.60% 50	22.34% 42	9.04% 17	5.32% 10	2.66% 5	188	3.21

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
Farmers are the mainstay of rural Ireland	52.66% 99	27.66% 52	12.23% 23	3.72% 7	2.13% 4	0.53% 1	1.06% 2	188	1.81
Farmers are the ones most closely connected to the environment in Ireland	40.43% 76	30.85% 58	14.36% 27	9.57% 18	1.06% 2	3.19% 6	0.53% 1	188	2.12
Farmers understand the environment in ways that experts often fail to appreciate	41.49% 78	26.60% 50	19.68% 37	7.45% 14	1.60% 3	2.66% 5	0.53% 1	188	2.11
Most people who are important to me would approve	36.17% 68	42.02% 79	12.23% 23	6.38% 12	1.06% 2	0.53% 1	1.60% 3	188	2.02

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
of environmental practices									

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Role Farmers Play in Rural Ireland: Story-Makers

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
Most farmers are taking on environmental practices on their farms	20.00% 2	10.00% 1	10.00% 1	30.00% 3	20.00% 2	10.00% 1	0.00% 0	10	3.50
Farmers are the mainstay	50.00% 5	30.00% 3	20.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10	1.70

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
of rural Ireland									
Farmers are the ones most closely connected to the environment in Ireland	70.00% 7	30.00% 3	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10	1.30
Farmers understand the environment in ways that experts often fail to appreciate	10.00% 1	50.00% 5	20.00% 2	20.00% 2	0.00% 0	0.00% 0	0.00% 0	10	2.50

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
Most people who are important to me would approve of environmental practices	60.00% 6	40.00% 4	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10	1.40

APPENDIX 22:

Detailed results of questions on Perceived Efficacy for the Wider Group of Farmers and the Story-Makers Group.

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Responses of Wider Group on Perceived Efficacy

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
Implementing good environmental practice on my farm would make a difference to the environment in my area	31.91% 60	34.57% 65	19.68% 37	7.98% 15	2.66% 5	2.13% 4	1.06% 2	188	2.26
Implementing environmental practices on my farm would make	23.94% 45	22.34% 42	21.81% 41	18.09% 34	4.26% 8	4.79% 9	4.79% 9	188	2.90

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
an important contribution to reducing climate change									

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Responses from story-makers in relation to Perceived Efficacy.

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
Implementing good environmental practice on my farm would make a difference to the environment in my area	90.00% 9	10.00% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10	1.10

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
Implementing environmental practices on my farm would make an important contribution to reducing climate change	20.00% 2	30.00% 3	30.00% 3	0.00% 0	20.00% 2	0.00% 0	0.00% 0	10	2.70

APPENDIX 23:

Detailed results of questions on Motivation to Comply for the Wider Group of Farmers and the Story-Makers Group.

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Table 28: Responses of Wider Group on Motivation to Comply

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
I would adopt good environmental practices if it is an important Teagasc priority	10.64% 20	20.21% 38	25.53% 48	24.47% 46	6.91% 13	6.38% 12	5.85% 11	188	3.39
I would adopt good environmental practices if it is an important Carbery priority	28.19% 53	36.70% 69	19.68% 37	7.98% 15	1.60% 3	2.66% 5	3.19% 6	188	2.39

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
I would adopt good environmental practices if Cork County Council expected me to	13.83% 26	31.38% 59	21.28% 40	17.55% 33	7.45% 14	3.72% 7	4.79% 9	188	3.04
I feel my family friends would be disappointed if I didn't adopt good environmental practices on my farm	27.66% 52	25.53% 48	22.87% 43	14.36% 27	2.66% 5	4.26% 8	2.66% 5	188	2.62
I care what people in the local community expect me to do in relation to environmentally-friendly practices on my farm	24.47% 46	28.72% 54	20.21% 38	16.49% 31	4.79% 9	2.66% 5	2.66% 5	188	2.67

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
The threat of fines and/or being reported in the local paper motivates me to adhere to environmental regulations on my farm	20.74% 39	18.62% 35	21.81% 41	18.09% 34	8.51% 16	4.79% 9	7.45% 14	188	3.19

Likert Scale = 1: Strongly Agree, 2: Agree, 3: Agree somewhat, 4: Neither agree nor disagree, 5: Disagree somewhat, 6: Disagree and 7: Disagree Strongly

Responses from Story-Makers on Compliance

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
I would adopt good environmental	0.00% 0	10.00% 1	0.00% 0	30.00% 3	0.00% 0	40.00% 4	20.00% 2	10	5.20

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
practices if it is an important Teagasc priority									
I would adopt good environmental practices if it is an important Carbery priority	0.00% 0	30.00% 3	20.00% 2	10.00% 1	10.00% 1	10.00% 1	20.00% 2	10	4.10
I would adopt good environmental practices if Cork County Council expected me to	50.00% 5	10.00% 1	10.00% 1	10.00% 1	10.00% 1	10.00% 1	0.00% 0	10	2.50
I feel my family friends would be	30.00% 3	40.00% 4	20.00% 2	10.00% 1	0.00% 0	0.00% 0	0.00% 0	10	2.10

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
disappointed if I didn't adopt good environmental practices on my farm									
I care what people in the local community expect me to do in relation to environmentally- friendly practices on my farm	20.00% 2	30.00% 3	30.00% 3	0.00% 0	0.00% 0	10.00% 1	10.00% 1	10	3.00
The threat of fines and/or being reported	20.00% 2	10.00% 1	10.00% 1	10.00% 1	20.00% 2	30.00% 3	0.00% 0	10	3.90

STATEMENTS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL	WEIGHTED AVERAGE
in the local paper motivates me to adhere to environmental regulations on my farm									

APPENDIX 25: THEMES FROM DATA 'WHAT NEEDS TO HAPPEN, IN YOUR OPINION, FOR FARMERS TO ADOPT ENVIRONMENTALLY-FRIENDLY PRACTICES?

MILK PRICE AND MARKET CONDITIONS

1. Pay farmers a fair price for their milk to equal the cost of production
2. Farmers need a fair price for their produce and maybe then they would not have to farm intensively
3. A profitable margin on our produce would be very beneficial, not just break even
4. While it is very important for farmers to adopt these practices, it should not come at a financial cost to the farmers as it does always. The burden should be shared by co-op's and processors. Markets are more connected to supply and demand, not environment. This shouldn't be used for another financial gain on the farmer
5. If extra effort to care for our environment opens new and strong markets for Carbery to sell our product, I think it would have a real benefit to increasing awareness. But we will need proof of this in the price paid to those of us who made the effort and not across the farmers, as there are some very poor and careless producers.

6. I own and run a family farm in that the income the farm generates buys food, clothes, light and heat for my family. If farming environmentally threatens my income, can you expect me to be in favour of it? If people want environmentally friendly farming, the price for food needs to rise in the shops and be passed back to the farmer
7. Buyers support is vital
8. Farmers need to be paid appropriately for their produce. This will ensure that land is not overstocked, with excessive levels of fertiliser and feed being used i.e., get paid well for producing food from grass
9. Get properly paid for what they do
10. Most farmers including me would happily implement strategies to improve practices on our farm if it was to help the environment and wildlife, if we got a good price for our milk but greener milk will not have a dramatic influence on milk price, supply and demand does, so if the tax payer wants greener food, let them pay for it first and have it passed directly to the farmer and not the retailers who make all the money. Farmers including me would try anything to improve farming practices if they are making a decent living first.
11. Price of milk has to increase! Not possible to have big borrowings with low milk price
12. It could be a strong marketing tool to produce dairy products in a sustainable and environmentally friendly way that could lead to premium prices for our milk, this should encourage dairy farmers to do it right!
13. Better farm produce prices to fund environmental practices

14. This is a good project to start with but I think Carbery could do a lot more in this area in selling the product by marketing it better at home or abroad. We have a super story to tell so let's tell it to all. Farmers need to know what sustainability is worth in money terms to them
15. Farmers need to receive a just wage for their produce that would be a basis from which they might be able to afford environmentally friendly practices.
16. Farmers have to be paid a good price for their produce to fund a fair wage and to adopt good environmental practices
17. Farmers need to be encouraged via milk pricing to adopt these practices 'there is no such thing as a free lunch'
18. Need to get more money for our milk to invest on the farm
19. We need money to be put back in our pockets for work and practices that would be beneficial for everyone, through better return for our produce
20. The importance of environmental practices to Carbery and its clients needs to be communicated to the farmers and the financial gain that can be achieved by improving environmental efficiencies.
21. Pay more for food that is produced from environmentally friendly farms
22. Farmers need to understand the need. Environmentally friendly farming will put more money in farmers pockets. It is not necessarily an extensive way of farming. Show farmers the opportunities through the Carbery Greener Dairy Programme to

make more money through environmentally friendly farming practices. Show farmers through the milk cheque of values of such practices to the consumer

23. Getting paid premium price if we invest in controls to protect the environment i.e., USA feedlots

24. Farmers need to see that any environmentally-friendly practices they implement are recognised by the processor and end user as an added value which is worth more over product that has less traceability or environmental practices

25. They need to get a premium price for their environmentally friendly product

26. Must be properly paid for our products and not just getting the left-overs and being forced by regulation

27. Strictly link this to a higher price for our product

28. We need to see more benefit at farm level as we implement upgrades – in other countries e.g., NZ and USA, they are not as compliant as us and yet they seem to get similar margins?

29. Make a link between better farm profits and eco-friendly practices. I feel a lot of farmers won't do anything unless there is a financial reward in it

30. "Strong marketing of our unique production environment to help sell our products globally, leading to increased value for farmers".

31. "For farmers to adopt environmentally friendly practices, I think Carbery should inform farmers of the bonus of selling products which are environmentally friendly produced"

32. “Show why it is important to Carbery”

GRANTS & INCENTIVES (“It’s good for the rabbits and hedgerows but not for My Pocket”)

1. The cost of some sustainable methods i.e., water harvesting and solar can be prohibitive
2. “Farmers need to be encouraged to adopt measures by financial incentives”
3. “It is not possible on most farms to implement environmentally-friendly practices which require investment as the money is needed in so many places on the farm. I feel more people would take up environmental schemes if their advisor was paid by the the Department of Agriculture. Farmers won’t take on an environmental scheme if he gets paid €5,000, for example, but advisors and planners etc. take €2,000 or more off him for it. Farmers are trying to keep themselves in a job and not everyone else, if it’s at their cost”
4. Better bonus e.g., grants of 70% or greater for any member of society who install wind turbines, solar panels etc”
5. “Farmers react to money ... they need to be paid to implement these practices (and paid well at the start) then reduce payments as practices are in place and easier to run. It’s all about the money”.
6. Costs need to be reduced
7. More money support would encourage such a practice – grants attached to environmental practices
8. I think there should be a separate grant available to introduce environmentally friendly practices. That would make it easier for farmers to adapt their practices”

9. Financial incentive from the Department of Ag
10. Need to be more grants for solar panels to heat water
11. "Educate factually, then incentivise implementation linked to a sealed reward system for the maintenance of the environmentally friendly method(s) adopted. No reward for non-compliance or discontinuation of a practice that is more beneficial to the environment. If the environment benefits long term, we all have a part to play".
12. As most farmers main concern is making a living to support their family, EEP's need to have a financial advantage to be unilaterally adopted.
13. Financial reward can be a great incentive
14. Better government support! For example, people supplying power through wind energy are not getting a fair price for their KW power compared to what they are paying for it!
15. Farmers will use environmental practices if it doesn't cost too much
16. Grants, better rewards
17. Good grants from state aid
18. Practices should not affect farmers financially
19. The cost/return on implementation of individual renewable/energy and grants to incentivise these investments.

20. Make it less expensive to adopt environmentally friendly practices to be rewarded in some way for implementing environmental changes
21. Most farmers I think will respond to monetary incentives
22. The problem I see with all new regulations and practices is it all costs the farmer hard earned income. It's ok to implement these regulations, they all make sense but why should the farmer pay? It effects everybody
23. There is the cost factor
24. Financial assistance
25. Grants would entice farmers and young farmers to introduce these practices on their own farm if they were available and beneficial in cutting down day to day running costs to the farm
26. A good grant support system would really help
27. Farmers should be encouraged financially e.g., good payment for producing electricity, wind power, and feeding it into the national grid
28. Government schemes to encourage towards environmental practices
29. I think farmers need to be financially compensated for good environmental practices. Farmers do not make good money for the hours they put in, in relation to other jobs. Good environmental are great but the money is not always there to put such practices in place e.g., installing solar panels – environmentally friendly, cost effective over time, expensive to install

30. Financial incentives

31. To be rewarded in monetary terms

32. We need to financially incentivise to adopt more environmental practices. Most farmers will look after themselves first and then the environment.

33. Environmentally friendly practices need to be cost effective

34. Money talks i.e., grants. What potential saving that can be made by adopting an environmentally friendly practice i.e., solar panels and payback time. Promotional offers on different practices. A feed in tariffs for PV panels and other renewable sources of electric generation

35. Cost reduction and more grants

36. If a farmer can see a real return for his efforts. Money talks.

37. Make it worth their while. A farmer will work if you pay him, incentives need to be made available e.g., bonuses, grants.

38. Pay more in subsidies

39. For it to be financially feasible in regard to grants

40. Better incentives in place for farmers who implement these practices

41. Need to rewarded for their efforts

42. Cost-free / neutral

43. If it was grant approved, it could appeal if made financial sense
44. Needs to be incentivised
45. More support from government
46. Those practices need to be made inexpensive and grant assisted
47. Need to get payments to encourage them to adopt
48. All farmers need a better understanding of good environmental practices and its benefits, more advanced practices need to be costed and the rewards for implementing them explained fully so farmers can adopt them quicker
49. Financial incentives, price incentives on farm inputs such as UREA,
50. Incentives of better use of land farmed
51. List of what are environmentally-friendly practices, what the benefits will be, what the costs will be etc. A carrot approach rather than a stick approach would work best. Cash strapped farmers are under enough pressure.
52. Has to contribute to bottom line
53. Targeted grant-aid
54. Definition of sustainable: if I stop farming tomorrow, it's sustainable for rabbits and furze but not for my 4 children. If I can't farm to meet the efficiency the markets demand, then I am not sustainable, a strong economic rationale needs to be layed out for farmers to see the benefits

55. Cash incentives

56. Tax breaks

57. Financial rewards for farmers who adhere to good environmental practices

58. Subsidization

59. Farmers do need available cash to make big changes to some practices. Awareness of savings and pay-back periods need to be known

60. Needs to be economically viable

61. I understand this is being aimed at farmers. We are being screwed left, right and centre with the price we are getting for our products at the farm gate and also we have to pay over the top for the raw materials it takes to run our farms. I would say most farmers would be happy to adopt more environmentally friendly habits but Jaysus most of us are borrowed up to our eye balls and with mostly 100 hour weeks for crap money, Jaysus what more can we do?

62. A positive return needs to be made to the farmer for carrying out good environmental practices. It is not good that any return should be to the processor and retailer only. Any extra costs in carrying out changes to farm practices need to be compensated for.

PENALTIES AND ENFORCEMENT

1. Financial penalties
2. Teach farmers rather than the Department DAFM frightening farmers into cross compliance/red tape. Farmers enjoy learning and penalising farmers does not teach us how to improve the environment.
3. No two farmers are the same. Unfortunately, some farmers will have to be fined/punished to get them to comply with some environmental practices. Fortunately, these are the minority.
4. “Stronger enforcement of general good practice on farms”
5. appropriate fines on rule breakers
6. “I believe in protecting the environment and have an interest in birds and wildlife in general. However, with so many inspections, it is difficult to get things 100% right.”

NEED FOR EDUCATION AND INFORMATION

1. Need for education and workshop groups
2. "I do believe farmers have to be educated more about environmentally friendly practices. They would have to be informed about them and told how they would benefit the farm/business in the long run"
3. "We need more solid information on our role and impact on the environment"
4. "Continual guidance from Carbery as to what they want / customer expectations"
5. Information through Teagasc
6. "More education and training days, discussion groups on farms"
7. "Farmers need to be educated on how to be more environmentally friendly. Most farmers don't realise the harm that they are doing"
8. Education
9. "Education, showing farmers how to farm successfully without costing the earth"
10. "Change can be difficult for farmers but if they are made aware of the benefits to themselves as well as to their communities of improving the environment on their farms. Positive PR and education are much more beneficial than fines etc. The education must come from within the farming community/ co-op's as farmers are suspicious of outsiders e.g., County Council, Department of Agriculture advice"

11. "Young family members are a very important influence on farmers i.e., children"
12. "It is important that discussion groups focus on environmental aspects of agriculture"
13. "As farmers and consumers we need to buy into the clean green image of not just Carbery but all Irish foods".
14. "There needs to be financial incentives to do courses on the environment".
15. "Farmers need to be better informed on better environmental practices. Teagasc have been a disaster advising farmers over the years. The farming organisations a little better"
16. More awareness
17. Education
18. "To encourage overall awareness of environmentally friendly farming
19. "Farmers need to be made more aware of the importance of protecting the environment
20. Knowledge, easy to implement
21. "Education especially showing the cost-benefit. Most farmers will learn from other farmers, talking about environmental practices / rather than regulations / can bring better buy-in."
22. Advice should be readily available from co-op's and Teagasc
23. "Less regulation and more support"
24. More education

25. "Proper explanation of the benefits"
26. "One size fits all does not work, make them local to the area"
27. "I feel farmers need to be supplied with more information regarding environmentally friendly practices. This, in turn, will help farmers, like myself and others to adopt easier and more efficient ways to farm".
28. "Just feed them good, honest, science-based information"
29. Learn more about environmentally friendly practices and help with funding
30. "Farmers are trying to be environmentally friendly, more information on what we need to do better, at what cost that will come, and what will be gained environmentally in absolute figures would be a big help"
31. "Discussion groups need to be talking about it for themselves (not because dictated by County Council etc). Hopefully, these digital stories will show people how easy it is to adopt even a few environmentally friendly practices on their own farms"
32. "More education on basic, simple ways of minding the environment, to start and get people on board. Get a 'win' and progress from there."

TRUST FARMERS (SPREADING OF SLURRY)

1. "good environmental practices should be weather related, take into account different soil types farm types"
2. "I think the nitrates directive can be counter productive in relation to spreading dates etc. It's not practical, it must be linked to actual weather conditions".
3. "The closed period of spreading slurry and fertiliser is not fair on West Cork farmers as our climate here suits early applications of slurry and fertiliser in December/ January if weather conditions permit"
4. "Less calendar farming. Council and department to be more farmer friendly"
5. "Calendar farming/slurry application deadlines are not practical, put trust back in the hands of farmers"
6. "farmers know their land and the environment they work in best. Weather 'on the day' of a job such as spreading slurry is or should be in the hands of the farmer".
7. "Why can't we spread the slurry when the tanks are full, if weather permits? Why do Teagasc have to advise us when to do it?"
8. "Closed period of slurry spreading needs to be considered for Irish climate. Often best conditions for slurry spreading can be during closed periods. No-one wants to pollute the environment. Logically, slurry is valuable and should be spread to maximise return".
9. "Less fertilisation and better use of slurry"

10. Dates given for spreading slurry doesn't allow for weather over a year"
11. "spreading slurry in Spring if ground conditions are right"
12. "Department should relax slurry spreading rules during closed periods as you can get dry spells during Winter sometimes.

Let farmers use their common sense (we know the value of slurry and don't want to waste it!)

FARMERS KNOW BEST

1. "Don't lecture farmers, encourage always – farmers as a rule find it difficult to change and is always afraid of livelihood might be taken from them".
2. "More positive press e.g., farmers stepping up
3. "If farmers were made feel more important in their role as custodians of the countryside, I think the responsibility might spur them on to better environmental practices"
4. "Highlight the great work that farmers already do in protecting the environment. Sustainability has 3 pillars > environmental, social and economic. Why not concentrate on sustainability as a whole rather than 3 individual pillars"
5. "It has to be up to every farmer to adopt, all down the years, Teagasc have not been right to guideline us to best farm practices. We have to keep and pass on some of the old ways of good farming, most farmers love their land and strive to keep it at its best so we need to cut out half of the red tape".

SUGGESTIONS ON SCHEMES AND PRACTICES

1. Adhere to chemical and pesticide regulations
2. Keep within stocking density guidelines and organic manure applications
3. Maintain hedgerows
4. Conserve resources and use as much green energy as possible
5. Plant trees and hedgerows where it is practical to do so
6. Changing to night rate electricity.
7. Install plate cooler.
8. Soil testing
9. “recycle plastic on a regular basis and try to keep the farm as tidy as possible”.
10. Make them plant hedges and trees on their farms as part of getting their B.P.S payments
11. “We need more incentives like REPS to carry out environmental practices e.g., hedgerows and fencing off water wells and streams”
12. “As regards friendly practices, the waste plastic is a great scheme and should be done TWICE a year – some cheap way of collecting rubbish from farms – to stop people burning!”

13. "Co-op's in my opinion should help in recycling i.e., take back fertilisation bags in in bulk. They should set up depots and collection points."
14. "Free plastic collection or drop off points"
15. "A scheme similar to REPS needs to be introduced. GLAS looks good from a carbon perspective but it is only suitable for extensive enterprises. It would be better to have a scheme that prioritised the environment and carbon aspects for an intensive enterprise"
16. "Use more UREA than CAN. Spread slurry with trailing shoe".
17. "We need meetings to address it more in my locality and surrounding areas. We need to come up with ideas and schemes to get people interested".
18. "To be encouraged to change their attitude and behaviour regarding the use of sprays, pesticides and other chemicals, that less is maybe better than more"
19. "I think REPS scheme in the past were insufficient. Farming and agriculture as a whole just encourage *LAZY* farming"
20. "There needs to be a new scheme like REPS put in place for farmers to change to environmentally friendly practices"
21. "They need to want to do it themselves"
22. A new REPS type scheme

23. “Co-op’s and agri merchants should be promoting more environmentally friendly practices, they should take back empty fertiliser bags, covers, pallets, silage covers etc for recycling”
24. “More audits for food processors”
25. “A lot of farmers have old gravity well that should be put working, free water to water tanks? Wood burning stove would make a big difference instead of burning oil”
26. “For farmers, Teagasc and County Council to set up a group of people to work together on how all of these rules are to be worked out”
27. “Information on farmers role and impact on the environment, led by Department of Agriculture, Teagasc, Carbery and the Co-op’s”

DEMONSTRATION

- 1 “Show farmers that these measures are working for other farmers”
- 2 “Lead by example i.e., electric cars for all company CEO’s, government ministers, judges etc”
- 3 “Recent group meeting in Darragh College, all ditches burned off with round-up, poor example to young farmers and visiting groups”
- 4 “Others to show example i.e., the Council won’t even cut the likes of the road. Seeds are spreading on account of this”

NOT OUR FAULT

4. "Everyone is blaming farmers about the environment but what about the big chemical factories polluting the air? What about all the planes flying over the world and all the fuel that they use. Nothing is said about that"
5. "Flash flooding and heavy rain is a problem on farm yards. I think a big environment problem is sea side towns and villages with poor waste and sewage works. Farmers have to be on top of their job because they have to pass so many inspections"

WE ARE ALREADY DOING IT

1. "I feel a lot of farmers are implementing environmentally friendly practices and they upgrade facilities, so it's a gradual process with expansion the more focused farmers are also environmentally conscious".
2. "Farmers already adopt environmentally friendly practices"
3. "In my opinion, most farmers are environmentally friendly"
4. "I think all farmers are implementing environmental practices already through the nitrates directive and recycling of silage / bale covers etc.
5. Present system of inspections seems to work

NEED FOR COMMON SENSE

Six statements on common sense needed, practices need to be practical, easily implemented and scheme and policies need to make sense and not to contradict each other.

OTHER

8. "More research"
9. I don't think it is any of my business what other farmers do with their land or the way that they farm, it is up to the individual"
10. Need for farm attitude change
11. Need for it to become the norm
12. "A minister for environment who knows what they are talking about (non green party).
13. Most farmers have pride in the visual impact of their business. Environmentally friendly can be advertised to this
14. Not to mention the naïve attitude of some environmentalists.

APPENDIX 24: Detailed Examination of the Views of Each Digital Story

The following sections examine each story viewed individually and provide the reader with a detailed analysis of each. This is presented in the following format for each story:

- A table with the responses given to each statement presented to the viewer
- A textual summary of the responses
- The results of what changes farmers could see themselves implementing on their farm and when
- The reasons for their answers

STORY 1: MICHAEL CROWLEY – RESPONSES FROM THOSE WHO WATCHED HIS DIGITAL STORY

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
This story is about people like me	45.45% 25	40.00% 22	14.55% 8	0.00% 0	0.00% 0	0.00% 0	0.00% 0	55
This story is informative about environmental good practices on farms	23.64% 13	45.45% 25	23.64% 13	1.82% 1	3.64% 2	0.00% 0	1.82% 1	55
This is a personal story about the farmer who made it	61.82% 34	27.27% 15	9.09% 5	1.82% 1	0.00% 0	0.00% 0	0.00% 0	55

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
I made an emotional connection with this story	38.18% 21	21.82% 12	23.64% 13	12.73% 7	3.64% 2	0.00% 0	0.00% 0	55
This story is entertaining and enjoyable	36.36% 20	34.55% 19	21.82% 12	3.64% 2	1.82% 1	0.00% 0	1.82% 1	55
This story has had a positive impact on my attitude to the environment	30.91% 17	36.36% 20	23.64% 13	9.09% 5	0.00% 0	0.00% 0	0.00% 0	55
I prefer looking at this story to reading scientific data on the environment	36.36% 20	30.91% 17	20.00% 11	5.45% 3	3.64% 2	3.64% 2	0.00% 0	55
I prefer to receive information on the environment from external advisers and experts	5.45% 3	18.18% 10	25.45% 14	21.82% 12	10.91% 6	18.18% 10	0.00% 0	55

Summary of Answers

In terms of how farmers preferred to receive information, forty-eight of the farmers said that they would prefer to look at the digital story to looking at scientific data on the environment, although conversely 27 of the respondents said that they prefer to receive information on the environment from external advisers and experts.

Implementation

Farmers were then asked what they saw in the digital story, that they could see themselves implementing on their farm. The online survey provided a free form text box for farmers to respond and farmers made the following references in terms of what they could see themselves implementing on their farm as a result of looking at Michael Crowley's digital story.

Grass & Soil Fertility

Thirty-nine statements were made in relation to grass and soil fertility including; Improving grass yields; achieving 80% of slurry spread in Spring; spreading more lime; taking regular soil samples; using a trailing shoe on vacuum tank; draining poor ground; having a better use of nutrients; careful use of pesticides and fertiliser.

Nature and Biodiversity

Ten farmers stated that they would maintain hedgerows, leave wild flowers to grow and leave areas on the farm for wildlife to 'survive'.

Water

Three statements were made in relation to reducing water usage on farm.

Energy

Three statements were made in relation to saving energy on the farm. One farmer requested more information on practical ways to do this and he would have liked to see this in the video.

Other

There were a number of comments included which did not fit into the above categories and these are as follows:

Two farmers stated that they would like to get their children more involved in farming. One farmer commented on how well the farm was laid out as a safe working area. One farmer said he had learned about having a better attitude to maintaining the environment in keeping up good farming practices, from viewing the digital story. **Two** farmers spoke of the next generation with comments “I would like to ... improve things for the next generation” and “The farmers attitude is brilliant, we are just caretakers of de land, it hit me that he is so young and already thinking of succession”. Lastly, **two** farmers commented that they had learned of the financial implications of sustainability with comments “More care for my environment doesn’t have to cost me any money” and “That nature and good farming can exist on the same farm and sustainability may not cost farmers money”. A final comment was from **one** farmer that “Michael’s approach to getting the basics right makes a lot of sense and is one we could all implement”.

Timing of Changes

The 55 farmers were then asked when they would implement the changes they had referred to in the previous question. The survey was completed in 2016 and as per the table below, 18 farmers responded that they would change straight away with the majority (31 farmers) saying that they would do so in the next year.

ANSWERS	RESPONSES
Straight away	32.73% 18
2017	56.36% 31
2018	1.82% 1
2019	3.64% 2
Not applicable	5.45% 3
Total	55

Reasons for their Answers

Farmers were then asked to give reasons for their answers and 48 farmers responded to this question.

Profitability and Cost Reductions

Twenty-five farmers stated that they would be interested in growing more grass, increasing grass yield, saying that better grassland management improves milk solids and increases profits. One farmer referred to the cost benefits “If spreading more

slurry in the Spring means I can save on buying bag fertiliser then it's a no brainer". The answer to the reason for change in this category seemed to be predominantly profit driven.

Nature

Five statements related to nature speaking of promoting natural habitats and flowers for bees. One farmer stated that "it can be easy to forget that wildlife is important. However, one of the farmers stated that "Poor ground may have a benefit for wildlife and nature but there is no financial benefit to leaving this type of land as it is so draining and cultivating is the best option."

Future Generations & Family

Five statements related to family and future generations, with farmers stating the importance of the environment to future generations. However, one of these farmers suggested that one statement related to succession and lifestyle and one farmer saying that "The Farm I run is not a family farm rather a commercial unit, it's a good story from a family/generation point of view but I prefer facts and figures to show me true results on environmental possibilities from people in that field of expertise".

Financial Implications

Four farmers focused on financial implications with two of these stating that they wished to improve farm income from their changes and to get a higher yield. The other two farmers said they would not have the finances to make changes saying "Money is not available at this time" and "Money is tight so hopefully a better return next year and I can implement those plans".

Identification with Storyteller

Three farmers identified with the storyteller with comments such as “Information given in a way I could relate to and makes me feel I could improve my farming” and “Farmers only have so much time, you have to prioritise what you have time for and what will make or save money. This video makes a clear and valid case for both, spoken from a man (Michael) who can walk the walk. Credibility” and ““Michael has a clear focus which leads to sound practices. Gaining and maintaining a similar focus could help us all to improve our results.”

Other

There were a number of other relevant comments made as follows:

Four farmers identified with Michael with such comments as “I’m in a similar situation to Michael” or “The video represents our situation fairly well”.

One farmer said that he approved of the ‘green image it sends out’ connecting the video perhaps with green marketing.

One farmer said he was interested as it avoided waste on the farm

One farmer said that “Age makes for more appreciation of what’s around them”

Lastly, **one** farmer said that there was not sufficient practical information in the digital story to make change “This video lacks usable information in this field so I cannot make a decision on implementation! Sorry!!”

STORY 2: JAMES FITZPATRICK – RESPONSES FROM THOSE WHO WATCHED HIS STORY

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
This story is about people like me	35.48% 11	48.39% 15	6.45% 2	6.45% 2	3.23% 1	0.00% 0	0.00% 0	31
This story is informative about environmental good practices on farms	22.58% 7	51.61% 16	12.90% 4	3.23% 1	9.68% 3	0.00% 0	0.00% 0	31
This is a personal story about the farmer who made it	29.03% 9	51.61% 16	12.90% 4	6.45% 2	0.00% 0	0.00% 0	0.00% 0	31
I made an emotional connection with this story	9.68% 3	45.16% 14	25.81% 8	6.45% 2	3.23% 1	9.68% 3	0.00% 0	31
This story is entertaining and enjoyable	12.90% 4	35.48% 11	32.26% 10	12.90% 4	3.23% 1	3.23% 1	0.00% 0	31
This story has had a positive impact on my attitude to the environment	22.58% 7	41.94% 13	22.58% 7	9.68% 3	0.00% 0	3.23% 1	0.00% 0	31
I prefer looking at this story to reading	35.48% 11	29.03% 9	19.35% 6	9.68% 3	3.23% 1	3.23% 1	0.00% 0	31

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
scientific data on the environment								
I prefer to receive information on the environment from external advisers and experts	9.68% 3	19.35% 6	29.03% 9	32.26% 10	6.45% 2	3.23% 1	0.00% 0	31

Summary of Statements

Thirty-one farmers viewed the video and responded to the questions asked. As per the above table, 27 of the 31 farmers felt that this story was about people like them. Similarly 27 of the 31 respondents also believed that the story was informative about good environmental practices on farms. Twenty nine of the 31 farmers felt that the story was a personal story about the farmer who made it, with 25 of the 31 respondents saying that they made an emotional connection to the story. Twenty-five of the farmers felt that the story was entertaining and enjoyable. All in all, 27 of the 31 farmers said that the story had a positive impact on their attitude to the environment.

In relation to how they preferred to receive information on the environment, 26 of the 31 would prefer to look at the digital story rather than reading scientific information on the environment, with 18 respondents saying they would prefer to receive information from external advisors and experts.

Implementation

This group of farmers were asked what did they see in the video, that they could see themselves implementing on their farm and 31 farmers responded to this under the following categories.

Water

Fourteen farmers said they were interested in areas relating to water such as; measuring water usage; rainwater harvesting; rainwater being fed to livestock; installing own water supply

Energy

Thirteen farmers were interested in areas relating to energy, having looked at the video such as; using night rate; trying to be energy efficient on the farm and home; geo thermal heating; watching electricity use and cost; using a plate cooler.

Nature and Biodiversity

Three farmers stated that they were interested in planting and maintaining hedgerows.

Future Generations and Family

One farmer said that he was interested in 'having regard for future generations'.

Timing of Changes

The 31 farmers were then asked when they would implement changes to their practices, based on the above. The survey was completed in 2016 and as per the table below, 9 farmers responded that they would change straight away with the majority (13 farmers) saying that they would do so in the next year. A further 6 farmers stated 2018 and two farmers saying 2019.

ANSWERS	RESPONSES
Straight away	29.03% 9
2017	41.94% 13
2018	19.35% 6
2019	6.45% 2
Not applicable	3.23% 1
Total	31

Reasons for Farmers Answers

Usage Reduction

Eleven farmers gave their reason as a wish to reduce water usage.

Financial Implications

Nine farmers were interested in changing practices due to the cost saving aspects of the story saying that it was ‘more economical’ or that it was good for ‘the pocket’.

Nature and Biodiversity

Two farmers said that they were interested in working with nature and with the hedgerows and the trees.

Identification with storyteller

Two farmers identified with the story-tellers saying that “I think similarly to these people” or “talking a lot of sense”.

Other

In the ‘other’ category, four respondents commented on the need for time to plan and implement change.

STORY 3: JOHN HURLEY – RESPONSES FROM THOSE WHO WATCHED HIS STORY

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGRE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
This story is about people like me	41.18% 14	52.94% 18	2.94% 1	2.94% 1	0.00% 0	0.00% 0	0.00% 0	34
This story is informative about	38.24% 13	47.06% 16	14.71% 5	0.00% 0	0.00% 0	0.00% 0	0.00% 0	34

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGRE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
environmental good practices on farms								
This is a personal story about the farmer who made it	35.29% 12	44.12% 15	11.76% 4	5.88% 2	0.00% 0	2.94% 1	0.00% 0	34
I made an emotional connection with this story	14.71% 5	41.18% 14	32.35% 11	11.76% 4	0.00% 0	0.00% 0	0.00% 0	34
This story is entertaining and enjoyable	11.76% 4	50.00% 17	26.47% 9	11.76% 4	0.00% 0	0.00% 0	0.00% 0	34
This story has had a positive impact on my attitude to the environment	14.71% 5	52.94% 18	29.41% 10	2.94% 1	0.00% 0	0.00% 0	0.00% 0	34
I prefer looking at this story to reading scientific data on the environment	23.53% 8	32.35% 11	29.41% 10	11.76% 4	2.94% 1	0.00% 0	0.00% 0	34
I prefer to receive information on the environment from external advisers and experts	8.82% 3	17.65% 6	29.41% 10	29.41% 10	8.82% 3	5.88% 2	0.00% 0	34

Summary of Statements

Thirty-four farmers viewed the video and responded to the questions asked. As per the above table, 33 of the 34 farmers felt that this story was about people like them. Similarly 33 of the 34 respondents also believed that the story was informative about good environmental practices on farms. Twenty-nine of the 31 farmers felt that the story was a personal story about the farmer who made it, with 30 of the 34 respondents saying that they made an emotional connection to the story. Thirty of the farmers felt that the story was entertaining and enjoyable. All in all, 33 of the 34 farmers said that the story had a positive impact on their attitude to the environment.

In relation to how they preferred to receive information on the environment, 29 of the 34 would prefer to look at the digital story rather than reading scientific information on the environment, with 19 respondents saying they would prefer to receive information from external advisors and experts.

Implementation

Once more these 34 farmers were asked what did they see in this video, that they could see themselves implementing on their farm and the following outlines the results of this question.

Grass & Soil Fertility

Thirteen statements were in relation to grass and soil fertility such as; more slurry in Spring and more soil testing

Nature

Eight farmers said they were interested in planting more trees.

Water

Seven statements were made in relation to water usage including; tank for storing water; recycling of water from plate cooler

Breeding

Two farmers stated that they wished to work on improving their breeding programme and “using all A1 high fertility high milk solids Sires at the start of the breeding season”.

Other

In the other category, **three** farmers said that they would like to pay more attention to plastic disposal. **Two** farmers said that they are doing most of these activities already but that ‘it still encourages me to be more environmentally aware’. **One** farmer was interested in the ‘tidy farmyard’ with one farmer commenting on family (‘good family farm’).

Timing of Changes

Farmers was asked when they could envisage themselves taking action and the table below summarises the results with 9 farmers saying 'straight away', 21 farmers saying the following year and one saying in two years.

ANSWER CHOICES	RESPONSES
Straight away	26.47% 9
2017	61.76% 21
2018	2.94% 1
2019	2.94% 1
Not applicable	5.88% 2
Total	34

Reasons for Answers

In terms of why respondents were interested in implementing certain activities, they gave the following answers.

Financial Implications

Nine respondents were interested in change in order to be more cost effective and to improve profits.

Nature and Biodiversity

Two farmers were interested in change in order to help biodiversity.

Usage Reduction

Two farmers said they wanted to reduce, conserve or recycle water.

Future Generations & Family

One farmer was interested due to the story being a 'lovely family story'.

Identification with Storyteller

Five farmers identified with the farmer with comments such as "I think similarly to these people" or "this clip is like my own farm and I can relate to it" or "I think like him" or "impressed by the simple small steps to improve farm and farmyard, for a safer cleaner workplace". One farmer stressed the need practical, local examples saying "I'm happy to listen to scientific experts with regard to the environment but they must provide farmers with real-life practical solutions that will work in every county, not just in theory".

Other

Three farmers said they wanted to reduce their carbon footprint / emissions and to protect the environment.

Two farmers said that the practices were easy to implement saying "it all makes common sense and when shown on the video, it's not a big deal to carry out" and "all makes sense and easy to implement".

One farmer said that the practices in the video were "better than burning".

STORY 4: DARRAGH KENNEDY – RESPONSES FROM THOSE WHO WATCHED HIS STORY

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
This story is about people like me	20.69% 6	37.9 3% 11	31.03% 9	0.00% 0	3.45% 1	6.90% 2	0.00% 0	29
This story is informative about environmental good practices on farms	37.93% 11	41.3 8% 12	17.24% 5	3.45% 1	0.00% 0	0.00% 0	0.00% 0	29
This is a personal story about the farmer who made it	20.69% 6	41.3 8% 12	34.48% 10	0.00% 0	3.45% 1	0.00% 0	0.00% 0	29
I made an emotional connection with this story	20.69% 6	20.6 9% 6	24.14% 7	20.69% 6	10.34% 3	3.45% 1	0.00% 0	29
This story is entertaining and enjoyable	17.24% 5	37.9 3% 11	20.69% 6	17.24% 5	3.45% 1	3.45% 1	0.00% 0	29
This story has had a positive impact on my	24.14% 7	51.7 2% 15	10.34% 3	13.79% 4	0.00% 0	0.00% 0	0.00% 0	29

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
attitude to the environment								
I prefer looking at this story to reading scientific data on the environment	27.59% 8	55.17% 16	6.90% 2	6.90% 2	0.00% 0	0.00% 0	3.45% 1	29
I prefer to receive information on the environment from external advisers and experts	6.90% 2	13.79% 4	17.24% 5	41.38% 12	17.24% 5	3.45% 1	0.00% 0	29

Summary of Statements

Twenty-nine farmers viewed the video and responded to the questions asked. As per the above table, 26 of the 29 farmers felt that this story was about people like them. Similarly, 28 of the 29 respondents also believed that the story was informative about good environmental practices on farms. Twenty-eight of the 29 farmers felt that the story was a personal story about the farmer who made it, with 19 of the 29 respondents saying that they made an emotional connection to the story (4 respondents disagreed with this with 6 respondents remained neutral). Twenty-two of the 29 farmers felt that the story was entertaining and enjoyable. All in all 25 of the 29 farmers said that the story had a positive impact on their attitude to the environment.

In relation to how they preferred to receive information on the environment, 28 of the 29 would prefer to look at the digital story rather than reading scientific information on the environment, with 11 respondents saying they would prefer to receive information from external advisors and experts.

Implementation of Changes

Once more, these 29 farmers were asked what did they see in this video, that they could see themselves implementing on their farm and the following outlines the results of this question.

Grass & Soil Fertility

Seventeen statements related to an interest in soil testing, re-seeding and maximising the use of fertiliser.

Energy

Four farmers were interested in energy usage with three expressing an interest in solar panels and one interested in looking at the “overall approach to energy use on the farm, being more efficient”.

Nature and Biodiversity

Three farmers stated that they were interested in growing more trees and fencing off areas for trees and wildlife.

Financial Implications

One farmer stated an interest in examining charges in order to reduce costs

Other

One farmer stated an interest in the mission statement for the farm.

One statement identified with the storyteller saying “God yer man is good!”

One statement related to wanting to reduce the carbon footprint on the farm.

Timing of Changes

Farmers was asked when they could envisage themselves taking action and the table below summarises the results with 8 farmers saying ‘straight away’, 14 farmers saying the following year and 3 saying in two years.

ANSWER CHOICES	RESPONSES
Straight away	27.59% 8
2017	48.28% 14
2018	10.34% 3
2019	0.00% 0
Not applicable	13.79% 4
Total	29

Reasons for Answers

In terms of why respondents were interested in implementing certain activities, they gave the following answers.

Financial Implications

Eleven statements related to an interest in grass and soil fertility in terms of increasing grass growth, making better use of slurry and saving money on fertiliser.

Future Generations and Family

One farmer gave his reason as being that 'it would be nice for future generations'.

Identification with Storyteller

Eight farmers spoke of identifying with the farmer including comments as "I can identify with all the positives on this farm" or "I believe we all need to be doing what these guys are doing and be aware of what is under our feet" and "Good to get focus and priorities key values" and "Everything Darragh said is true" and "Facts and figures are convincing evidence" and "Good technical information given in this video" and "Really enjoyed this short story which seemed to touch a lot of the messages that sustainable farming needs to get across". Interestingly, one of these farmers said that "That this is a company owned farm I feel changed my connection".

Other

Three farmers spoke the need for planning and taking it step by step.

STORY 5: SAM KINGSTON – RESPONSES FROM THOSE WHO WATCHED HIS STORY

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
This story is about people like me	28.00% 7	48.00% 12	12.00% 3	4.00% 1	4.00% 1	4.00% 1	0.00% 0	25
This story is informative about environmental good practices on farms	48.00% 12	32.00% 8	12.00% 3	4.00% 1	0.00% 0	4.00% 1	0.00% 0	25
This is a personal story about the farmer who made it	32.00% 8	28.00% 7	24.00% 6	8.00% 2	0.00% 0	8.00% 2	0.00% 0	25
I made an emotional connection with this story	16.00% 4	36.00% 9	20.00% 5	16.00% 4	0.00% 0	12.00% 3	0.00% 0	25
	24.00% 6	24.00% 6	32.00% 8	8.00% 2	8.00% 2	4.00% 1	0.00% 0	25

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
This story is entertaining and enjoyable		6						
This story has had a positive impact on my attitude to the environment	20.00% 5	52.00% 13	12.00% 3	12.00% 3	0.00% 0	4.00% 1	0.00% 0	25
I prefer looking at this story to reading scientific data on the environment	32.00% 8	48.00% 12	4.00% 1	12.00% 3	4.00% 1	0.00% 0	0.00% 0	25
I prefer to receive information on the environment from external advisers and experts	4.00% 1	20.00% 5	12.00% 3	44.00% 11	8.00% 2	12.00% 3	0.00% 0	25

Summary of Statements

Twenty-five farmers viewed the video and responded to the questions asked. As per the above table, 22 of the 25 farmers felt that this story was about people like them. Similarly, 23 of the 25 respondents also believed that the story was informative about good environmental practices on farms. Twenty-one of the 25 farmers felt that the story was a personal story about the farmer who made it, with 18 of the 25 respondents saying that they made an emotional connection to the story. Twenty of the 25 farmers felt

that the story was entertaining and enjoyable. All in all, 21 of the 25 farmers said that the story had a positive impact on their attitude to the environment.

In relation to how they preferred to receive information on the environment, 21 of the 25 would prefer to look at the digital story rather than reading scientific information on the environment, with 9 respondents saying they would prefer to receive information from external advisors and experts.

Implementation of Changes

Once more these 25 farmers were asked what did they see in this video, that they could see themselves implementing on their farm and the following outlines the results of this question.

Water

Twenty-one statements related to water including: installing meters to save water; Reed beds; rain water harvesting; organised own water supply; water recycling.

Energy

Two statements referred to an interest in the use of plate coolers.

Timing of Changes

Farmers was asked when they could envisage themselves taking action and the table below summarises the results with 5 farmers saying 'straight away', 10 farmers saying the following year, 2 saying in two years and 3 in three years time.

ANSWERS	RESPONSES
Straight away	20.00% 5
2017	40.00% 10
2018	8.00% 2
2019	12.00% 3
Not applicable	20.00% 5
Total	25

Reasons for Answers

In terms of why respondents were interested in implementing certain activities, they gave the following answers.

Six statements related to the farmers wish to reduce water usage, **two** statements related to the cost benefits, **two** farmers said they were interested due to making his farm more sustainable and helping the environment with one farmer interested in reducing

the impact on future generations. **Four** farmers were interested in increasing efficiency. Other reasons included that the story was inspirational (**one** statement).

STORY 6: Aidan McCarthy – RESPONSES FROM THOSE WHO WATCHED HIS STORY

	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
This story is about people like me	70.37% 19	25.93% 7	3.70% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	27
This story is informative about environmental good practices on farms	81.48% 22	7.41% 2	7.41% 2	3.70% 1	0.00% 0	0.00% 0	0.00% 0	27
This is a personal story about the farmer who made it	59.26% 16	25.93% 7	11.11% 3	3.70% 1	0.00% 0	0.00% 0	0.00% 0	27
I made an emotional connection with this story	59.26% 16	25.93% 7	11.11% 3	3.70% 1	0.00% 0	0.00% 0	0.00% 0	27

	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
This story is entertaining and enjoyable	62.96% 17	29.63% 8	0.00% 0	7.41% 2	0.00% 0	0.00% 0	0.00% 0	27
This story has had a positive impact on my attitude to the environment	70.37% 19	25.93% 7	0.00% 0	3.70% 1	0.00% 0	0.00% 0	0.00% 0	27
I prefer looking at this story to reading scientific data on the environment	62.96% 17	25.93% 7	7.41% 2	3.70% 1	0.00% 0	0.00% 0	0.00% 0	27
I prefer to receive information on the environment from external advisers and experts	25.93% 7	3.70% 1	22.22% 6	25.93% 7	11.11% 3	7.41% 2	3.70% 1	27

Summary of Statements

Twenty-seven farmers viewed the video and responded to the questions asked. As per the above table, 27 of the 27 farmers felt that this story was about people like them. Similarly, 26 of the 27 respondents also believed that the story was informative about good environmental practices on farms. Twenty-six of the 27 farmers felt that the story was a personal story about the farmer who made it, with 26 of the 27 respondents saying that they made an emotional connection to the story. Twenty-five of the 27 farmers

felt that the story was entertaining and enjoyable. All in all, 26 of the 27 farmers said that the story had a positive impact on their attitude to the environment.

In relation to how they preferred to receive information on the environment, 26 of the 27 would prefer to look at the digital story rather than reading scientific information on the environment, with 14 respondents saying they would prefer to receive information from external advisors and experts.

Implementation of Changes

Once more these 27 farmers were asked what did they see in this video, that they could see yourself implementing on their farm and the following outlines the results of this question.

Grass and Soil Fertility

Seventeen statements related to an interest in soil fertility and spreading lime.

Identification with Storyteller

Four farmers identified with the positivity of the story saying “All of it, I found it an inspiring piece of storytelling, so good it’s kind might never be seen again!” and “See that we are doing a great job” and “Concentrate on the positives” and a general interest in “looking after our environment is essential to good farm practices”.

Energy

Three statements revealed an interest in installing plate coolers and improving energy efficiency.

Other

Two farmers stated that they were already undertaking similar actions to the storyteller on their farms

Timing of Changes

Farmers was asked when they could envisage themselves taking action and the table below summarises the results with 13 farmers saying 'straight away' and 10 farmers saying the following year.

When do you intend to do this?

ANSWERS	RESPONSES
Straight away	48.15% 13
2017	37.04% 10
2018	0.00% 0
2019	0.00% 0
Not applicable	14.81% 4
Total	27

Reasons for Answers

Financial Implications

Fifteen statements related to the cost benefits of using lime instead of fertiliser and the benefits of growing more grass.

Nature and Biodiversity

Two farmers stated their reason was a wish to protect habitats.

Identification with Storyteller

Farmers identified with the storyteller and it inspired pride in his way of farming saying “I can identify with Aidan’s way of managing his farm” and “I’m in a very similar situation” and “We don’t give ourselves the credit that we deserve” and “Farm and farmer are a great shop window for milk production in West Cork” and “Overall a really good video and made me feel proud of our farming practices” and “Very clear video outlining the many positive changes a farmer can make” (**6** statements).

Other

One statement related to reasons of wanting to reduce carbon emissions

One statement related reasons of eliminating waste.

One statement relating to making all activity on the farm safe.

STORY 7: DONAL O'CONNOR – RESPONSES FROM THOSE WHO WATCHED HIS STORY

STATEMENTS	STRONGLY AGREE		SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
This story is about people like me	31.82% 7	50.00% 11	9.09% 2	4.55% 1	4.55% 1	0.00% 0	0.00% 0	22
This story is informative about environmental good practices on farms	50.00% 11	45.45% 10	4.55% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	22
This is a personal story about the farmer who made it	36.36% 8	36.36% 8	18.18% 4	9.09% 2	0.00% 0	0.00% 0	0.00% 0	22
I made an emotional connection with this story	18.18% 4	31.82% 7	36.36% 8	13.64% 3	0.00% 0	0.00% 0	0.00% 0	22
This story is entertaining and enjoyable	31.82% 7	31.82% 7	31.82% 7	4.55% 1	0.00% 0	0.00% 0	0.00% 0	22
This story has had a positive impact on my attitude to the environment	40.91% 9	27.27% 6	22.73% 5	9.09% 2	0.00% 0	0.00% 0	0.00% 0	22
I prefer looking at this story to reading	45.45% 10	40.91% 9	13.64% 3	0.00% 0	0.00% 0	0.00% 0	0.00% 0	22

STATEMENTS	STRONGLY AGREE		SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
scientific data on the environment								
I prefer to receive information on the environment from external advisers and experts	13.64% 3	18.18% 4	27.27% 6	31.82% 7	4.55% 1	0.00% 0	4.55% 1	22

Summary of Statements

Twenty-two farmers viewed the video and responded to the questions asked. As per the above table, 20 of the 22 farmers felt that this story was about people like them. Similarly, 22 of the 22 respondents also believed that the story was informative about good environmental practices on farms. Twenty of the 22 farmers felt that the story was a personal story about the farmer who made it, with 19 of the 22 respondents saying that they made an emotional connection to the story. Twenty-one of the 22 farmers felt that the story was entertaining and enjoyable. All in all, 20 of the 22 farmers said that the story had a positive impact on their attitude to the environment.

In relation to how they preferred to receive information on the environment, 22 of the 22 would prefer to look at the digital story rather than reading scientific information on the environment, with 13 respondents saying they would prefer to receive information from external advisors and experts.

Implementation of Changes

Once more these 22 farmers were asked what did they see in this video, that they could see themselves implementing on their farm and the following outlines the results of this question.

Water

Eighteen statements expressed an interest in the use of water including; Water sprinkling system; More recycling of water; water reduction and conservation; new water tank system and re-using the water to wash down dirty yards.

Energy

One farmer was interested in Installing a plate cooler.

Other

Two farmers were interested in the backing gate discussed in the video.

Timing of Changes

Farmers was asked when they could envisage themselves taking action and the table below summarises the results with 6 farmers saying 'straight away' and 8 farmers saying the following year and 6 farmers saying in two years.

ANSWERS	RESPONSES
Straight away	27.27% 6
2017	36.36% 8
2018	27.27% 6
2019	0.00% 0
Not applicable	9.09% 2
Total	22

Reasons for Answers

Usage Reduction

Six farmers were interested in changes as it would save and reduce water usage on the farm.

Financial Implications

One farmer stated the cost benefits associated with change.

Identification with Storyteller

Four farmers identified and felt encouraged by the storyteller saying “Well targeted presentation on water and recycling on a farm” and “This guy has a great grasp of water uses, mightn’t be replicable on all farms, but a very good story all the same” and “I have similar water needs” and “I can identify with the work that is carried out on this farm”.

Improving Efficiency

Three statements related to ‘speeding up milking’ and improving farm efficiency.

STORY 8: CORMAC O’KEEFFE – RESPONSES FROM THOSE WHO VIEWED HIS STORY

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
This story is about people like me	47.83% 11	39.1 3% 9	13.04% 3	0.00% 0	0.00% 0	0.00% 0	0.00% 0	23
This story is informative about environmental good practices on farms	43.48% 10	47.8 3% 11	8.70% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	23
This is a personal story about the farmer who made it	43.48% 10	30.4 3% 7	17.39% 4	8.70% 2	0.00% 0	0.00% 0	0.00% 0	23
I made an emotional connection with this story	30.43% 7	34.7 8% 8	34.78% 8	0.00% 0	0.00% 0	0.00% 0	0.00% 0	23
This story is entertaining and enjoyable	34.78% 8	52.1 7% 12	8.70% 2	4.35% 1	0.00% 0	0.00% 0	0.00% 0	23

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
		12						
This story has had a positive impact on my attitude to the environment	34.78% 8	65.2% 2% 15	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	23
I prefer looking at this story to reading scientific data on the environment	39.13% 9	47.8% 3% 11	13.04% 3	0.00% 0	0.00% 0	0.00% 0	0.00% 0	23
I prefer to receive information on the environment from external advisers and experts	8.70% 2	26.0% 9% 6	8.70% 2	30.43% 7	4.35% 1	17.39% 4	4.35% 1	23

Summary of Statements

Twenty-three farmers viewed the video and responded to the questions asked. As per the above table, 23 of the 23 farmers felt that this story was about people like them. Similarly, 23 of the 23 respondents also believed that the story was informative about good environmental practices on farms. Twenty-one of the 23 farmers felt that the story was a personal story about the farmer who made it, with 23 of the 23 respondents saying that they made an emotional connection to the story. Twenty-two of the 23 farmers felt that the story was entertaining and enjoyable. All in all, 23 of the 23 farmers said that the story had a positive impact on their attitude to the environment.

In relation to how they preferred to receive information on the environment, 23 of the 23 would prefer to look at the digital story rather than reading scientific information on the environment, with 10 respondents saying they would prefer to receive information from external advisors and experts.

Implementation of Changes

Once more these 23 farmers were asked what did they see in this video, that they could see themselves implementing on their farm and the following outlines the results of this question.

Nature and Biodiversity

Thirteen statements related to an interest in planting hedges, trees and leaving parts of the farm to nature.

Breeding

Four farmers were interested in improving herd Economic Breeding Index.

Grass and Soil Fertility

Three farmers said they would be interested in improving the soil PH and growing more grass.

Other

One farmer said he would be interested in preserving older buildings on the farm, **one** farmer said he would be interested in recycling plastic and **one** farmer said that what he had taken from the video was “that we are doing a lot of it already and we should not be afraid of the future”.

Timing of Changes

Farmers was asked when they could envisage themselves taking action and the table below summarises the results with 7 farmers saying 'straight away' and 14 farmers saying the following year and 1 farmer saying in two years and one farmer in 3 years.

When will you implement this change?

ANSWERS	RESPONSES
Straight away	30.43% 7
2017	60.87% 14
2018	4.35% 1
2019	4.35% 1
Not applicable	0.00% 0
Total	23

Reasons for Answers

Nature and Biodiversity

Seven farmers would be interested in change so as to protect wildlife habitats, to 'give back to nature', to 'soften the landscape' and to 'live in harmony with nature' and 'to provide more shelter for cows as well as a haven for birds and bees'.

Financial Implications

Three farmers said they were interested in change if it would increase profitability and make economic sense.

Other

Four farmers said they would be interested in change due to helping the environment and sustainability. **One** farmer said that the story was 'very enjoyable and informative' with one other farmer saying that his reason was because 'cows are getting too big'.

STORY 9: TIM O'MAHONY – RESPONSES FROM THOSE WHO WATCHED HIS STORY

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
This story is about people like me	22.73% 5	45.45% 10	22.73% 5	4.55% 1	4.55% 1	0.00% 0	0.00% 0	22
This story is informative about environmental	31.82% 7	45.45% 10	22.73% 5	0.00% 0	0.00% 0	0.00% 0	0.00% 0	22

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
good practices on farms								
This is a personal story about the farmer who made it	27.27% 6	45.45% 10	22.73% 5	4.55% 1	0.00% 0	0.00% 0	0.00% 0	22
I made an emotional connection with this story	9.09% 2	40.91% 9	27.27% 6	13.64% 3	4.55% 1	4.55% 1	0.00% 0	22
This story is entertaining and enjoyable	13.64% 3	36.36% 8	36.36% 8	9.09% 2	4.55% 1	0.00% 0	0.00% 0	22
This story has had a positive impact on my attitude to the environment	9.09% 2	45.45% 10	31.82% 7	9.09% 2	4.55% 1	0.00% 0	0.00% 0	22
I prefer looking at this story to reading scientific data on the environment	9.09% 2	63.64% 14	22.73% 5	0.00% 0	4.55% 1	0.00% 0	0.00% 0	22
I prefer to receive information on the environment from external advisers and experts	4.55% 1	18.18% 4	18.18% 4	31.82% 7	4.55% 1	22.73% 5	0.00% 0	22

Summary of Statements

Twenty-two farmers viewed the video and responded to the questions asked. As per the above table, 20 of the 22 farmers felt that this story was about people like them. Similarly, 22 of the 22 respondents also believed that the story was informative about good environmental practices on farms. Twenty-one of the 22 farmers felt that the story was a personal story about the farmer who made it, with 17 of the 22 respondents saying that they made an emotional connection to the story. Nineteen of the 22 farmers felt that the story was entertaining and enjoyable. All in all, 19 of the 22 farmers said that the story had a positive impact on their attitude to the environment.

In relation to how they preferred to receive information on the environment, 21 of the 22 would prefer to look at the digital story rather than reading scientific information on the environment, with 9 respondents saying they would prefer to receive information from external advisors and experts.

Implementation

Once more these 22 farmers were asked what did they see in this video, that they could see themselves implementing on their farm and the following outlines the results of this question.

Water

Nine statements related to installing water meters, fixing water leaks and lowering the amount of water used on the farm.

Energy

Eight statements related to monitoring electricity usage including looking more closely at energy costs and night rate electricity

Identification with Storyteller

Two farmers said that they were working along the same lines as this storyteller, with one respondent saying that there was no new information.

Other

One farmer said he would be interested in the use of the plate cooler to cool milk.

Timing of Changes

Farmers was asked when they could envisage themselves taking action and the table below summarises the results with 7 farmers saying 'straight away' and 14 farmers saying the following year and 1 farmer saying in two years and one farmer in 3 years.

When do you intend to implement this?

ANSWERS	RESPONSES
Straight away	22.73% 5
2017	40.91% 9
2018	18.18% 4
2019	0.00% 0
Not applicable	18.18% 4
Total	22

Reasons for Answers

Financial Implications

Eight farmers stated they would be interested due to the economic benefits of change.

Usage Reduction

Three farmers gave their reason as wishing to reduce water.

STORY 10: JOHN JOE O’SULLIVAN – RESPONSES OF THOSE WHO VIEWED HIS STORY

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
– This story is about people like me	31.82% 7	50.00% 11	13.64% 3	4.55% 1	0.00% 0	0.00% 0	0.00% 0	22
This story is informative about environmental good practices on farms	54.55% 12	36.36% 8	9.09% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	22
This is a personal story about the farmer who made it	54.55% 12	27.27% 6	13.64% 3	4.55% 1	0.00% 0	0.00% 0	0.00% 0	22
I made an emotional connection with this story	36.36% 8	45.45% 10	13.64% 3	4.55% 1	0.00% 0	0.00% 0	0.00% 0	22
This story is entertaining and enjoyable	50.00% 11	36.36% 8	13.64% 3	0.00% 0	0.00% 0	0.00% 0	0.00% 0	22
This story has had a positive impact on my attitude to the environment	54.55% 12	31.82% 7	9.09% 2	4.55% 1	0.00% 0	0.00% 0	0.00% 0	22

STATEMENTS	STRONGLY AGREE	AGREE	SOMEWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
I prefer looking at this story to reading scientific data on the environment	31.82% 7	50.00% 11	13.64% 3	4.55% 1	0.00% 0	0.00% 0	0.00% 0	22
I prefer to receive information on the environment from external advisers and experts	13.64% 3	9.09% 2	18.18% 4	27.27% 6	4.55% 1	22.73% 5	4.55% 1	22

Summary of Statements

Twenty-two farmers viewed the video and responded to the questions asked. As per the above table, 21 of the 22 farmers felt that this story was about people like them. Similarly, 22 of the 22 respondents also believed that the story was informative about good environmental practices on farms. Twenty-one of the 22 farmers felt that the story was a personal story about the farmer who made it, with 21 of the 22 respondents saying that they made an emotional connection to the story. Twenty-two of the 22 farmers felt that the story was entertaining and enjoyable. All in all, 21 of the 22 farmers said that the story had a positive impact on their attitude to the environment.

In relation to how they preferred to receive information on the environment, 21 of the 22 would prefer to look at the digital story rather than reading scientific information on the environment, with 9 respondents saying they would prefer to receive information from external advisors and experts.

Implementation of Changes

Once more these 22 farmers were asked what did they see in this video, that they could see themselves implementing on their farm and the following outlines the results of this question.

Nature and Biodiversity

Eighteen farmers were interested in improving biodiversity on the farm by; planting more hedges; sowing clover into grazing areas; investigating bee keeping; replacing ditches; and better use of sprays.

Identification with Storyteller

Two farmers admired the farmer saying ‘He is doing a great job’ and that the storyteller was ‘A farmer embracing the environment’.

Timing of Changes

Farmers was asked when they could envisage themselves taking action and the table below summarises the results with 7 farmers saying ‘straight away’ and 12 farmers saying the following year and 1 farmer saying in two years and one farmer in 3 years.

When do you intend to do this?

ANSWERS	RESPONSES
Straight away	31.82% 7
2017	54.55% 12
2018	4.55% 1
2019	4.55% 1
Not applicable	4.55% 1
Total	22

Reasons for Answers

Six farmers said they were interested in change as it would improve biodiversity including such statements as “Because minding our bee population might just be one of the most important things we could ever do on our farms” and “Give something back to nature” and “To give birds and other wildlife a habitat” and “The quality of milk is being produced in harmony with the environment as it should be”.

Five farmers were interested in increased efficiency and profitability (they believed these changes would increase milk protein, improve the quality of pasture, reduce nitrogen and use less fertiliser).

Three statements related to the reason being a “more pleasant work environment” and “improving the appearance of the farm” and that the “farmer is the guardian of the countryside”.

One farmer said the reason was that the story was a “Good presentation” and **one** other saying “Just love it. The land of milk and honey”.

Summary of Views Based by Statement

Summary of Statement: This Story is about People like Me

Story No.	Strongly Agree	Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Total
1	45.5% 25	40% 22	14.55% 8	0% 0	0% 0	0% 0	0% 0	55
2	35.48% 11	48.39% 15	6.45% 2	6.45% 2	3.23% 1	0% 0	0% 0	31
3	41.8% 14	52.94% 18	2.94% 1	2.94% 1	0% 0	0% 0	0% 0	34
4	20.69% 6	37.93% 11	31.03% 9	0% 0	3.45% 1	6.90% 2	0% 0	29
5	28% 7	48% 12	12% 3	4% 1	4% 1	4% 1	0% 0	25
6	70.37% 19	25.93% 7	3.70% 1	0% 0	0% 0	0% 0	0% 0	27
7	31.82% 7	50% 11	9.09% 2	4.55% 1	4.55% 1	0% 0	0% 0	22
8	47.83% 11	39.13% 9	13.04% 3	0% 0	0% 0	0% 0	0% 0	23
9	22.73% 5	45.45% 10	22.73% 5	4.55% 1	0% 0	0% 0	0% 0	22
10	31.82% 7	50% 11	13.64% 3	4.55% 1	0% 0	0% 0	0% 0	22
Total Views	112	126	37	7	5	3	0	290
Percentage	39%	43%	13%	2%	2%	1%	0	

Summary of Statement: This Story is Informative about Environmental Good Practices on Farms

Story No.	Strongly Agree	Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Total No.
1	23.64% 13	45.45% 25	23.64% 13	1.82% 1	3.64% 2	0% 0	1.2% 1	55
2	22.58% 7	51.61% 16	12.90% 4	3.23% 1	9.68% 3	0% 0	0% 0	31
3	38.24% 13	47.06% 16	14.71% 5	0% 0	0% 0	0% 0	0% 0	34
4	37.93% 11	41.38% 12	17.24% 5	3.45% 1	0% 0	0% 0	0% 0	29
5	48% 12	32% 8	12% 3	4% 1	0% 0	4% 1	0% 0	25
6	81.48% 22	7.41% 2	7.41% 2	3.70% 1	0% 0	0% 0	0% 0	27
7	50% 11	45.45% 10	4.55% 1	0% 0	0% 0	0% 0	0% 0	22
8	43.48% 10	47.83% 11	8.70% 2	0% 0	0% 0	0% 0	0% 0	23
9	31.82% 7	45.45% 10	22.73% 5	0% 0	0% 0	0% 0	0% 0	22
10	54.55% 12	36.36% 8	9.09% 2	0% 0	0% 0	0% 0	0% 0	22
Total Views	118	118	42	5	5	1	1	290
Percentage	41%	41%	15%	2%	2%	0.3%	0.3%	

Summary of Statement: This is a Personal Story about the Farmer who made it

Story No.	Strongly Agree	Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Total
1	61.82% 34	27.27% 15	9.09% 5	1.82% 1	0% 0	0% 0	0% 0	55
2	29.03% 9	51.61% 16	12.90% 4	6.45% 2	0% 0	0% 0	0% 0	31
3	35.29% 12	44.12% 15	11.76% 4	5.88% 2	0% 0	2.94% 1	0% 0	34
4	20.69% 6	41.38% 12	34.48% 10	0% 0	3.45% 1	0% 0	0% 0	29
5	32% 8	28% 7	24% 6	8% 2	0% 0	8% 2	0% 0	25
6	59.26% 16	25.93% 7	11.11% 3	3.70% 1	0% 0	0% 0	0% 0	27
7	36.36% 8	36.36% 8	18.18% 4	9.09% 2	0% 0	0% 0	0% 0	22
8	43.48% 10	30.43% 7	17.39% 4	8.70% 2	0% 0	0% 0	0% 0	23
9	27.27% 6	45.45% 10	22.73% 5	4.55% 1	0% 0	0% 0	0% 0	22
10	54.55% 12	27.27% 6	13.64% 3	4.55% 1	0% 0	0% 0	0% 0	22
Total Views	121	103	48	14	1	3	0	290
Percentage	42%	36%	17%	5%	0.3%	1%	0	

Summary of Statement: I made an Emotional Connection with this Story

Story No.	Strongly Agree	Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Total
1	38.18% 21	21.82% 12	23.64% 13	12.73% 7	3.64% 2	0% 0	0% 0	55
2	9.68% 3	45.16% 14	25.81% 8	6.45% 2	3.23% 1	9.68% 3	0% 0	31
3	14.71% 5	41.18% 14	32.35% 11	11.76% 4	0% 0	0% 0	0% 0	34
4	20.69% 6	20.69% 6	24.14% 7	20.69% 6	10.34% 3	3.45% 1	0% 0	29
5	16% 4	36% 9	20% 5	16% 4	0% 0	12% 3	0% 0	25
6	59.26% 16	25.93% 7	11.11% 3	3.70% 1	0% 0	0% 0	0% 0	27
7	18.18% 4	31.82% 7	36.36% 8	13.64% 3	0% 0	0% 0	0% 0	22
8	30.43% 7	34.78% 8	34.78% 8	0% 0	0% 0	0% 0	0% 0	23
9	9.09% 2	40.91% 9	27.27% 6	13.64% 3	4.55% 1	4.55% 1	0% 0	22
10	36.36% 8	45.45% 10	13.64% 3	4.55% 1	0% 0	0% 0	0% 0	22
Total Views	76	96	72	31	7	8	0	290
Percentage	26%	33%	25%	11%	2%	3%	0	

Summary of Statement: This Story is Entertaining and Enjoyable

Story No.	Strongly Agree	Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Total
1	36.36% 20	34.55% 19	21.82% 12	3.64% 2	1.82% 1	0% 0	1.82% 1	55
2	12.90% 4	35.48% 11	32.26% 10	12.90% 4	3.23% 1	3.23% 1	0% 0	31
3	11.76% 4	50% 17	26.47% 9	11.76% 4	0% 0	0% 0	0% 0	34
4	17.24% 5	37.93% 11	20.69% 6	17.24% 5	3.45% 1	3.45% 1	0% 0	29
5	24% 6	24% 6	32% 8	8% 2	8% 2	4% 1	0% 0	25
6	62.96% 17	29.63% 8	0% 0	7.41% 2	0% 0	0% 0	0% 0	27
7	31.82% 7	31.82% 7	31.82% 7	4.55% 1	0% 0	0% 0	0% 0	22
8	34.78% 8	52.17% 12	8.70% 2	4.35% 1	0% 0	0% 0	0% 0	23
9	13.64% 3	36.36% 8	36.36% 8	9.09% 2	4.55% 1	0% 0	0% 0	22
10	50% 11	36.36% 8	13.64% 3	0% 0	0% 0	0% 0	0% 0	22
Total Views	85	107	65	23	6	3	1	290
Percentage	29%	37%	22%	8%	2%	1%	0.3%	

Summary of Statement: This Story has had a Positive Impact on my Attitude to the Environment

Story No.	Strongly Agree	Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Total
1	30.91% 17	36.36% 20	23.64% 13	9.09% 5	0% 0	0% 0	0% 0	55
2	22.58% 7	41.94% 13	22.58% 7	9.68% 3	0% 0	3.23% 1	0% 0	31
3	14.71% 5	52.94% 18	29.41% 10	2.94% 1	0% 0	0% 0	0% 0	34
4	24.14% 7	51.72% 15	10.34% 3	13.79% 4	0% 0	0% 0	0% 0	29
5	20% 5	52% 13	12% 3	12% 3	0% 0	4% 1	0% 0	25
6	70.37% 19	25.93% 7	0% 0	3.70% 1	0% 0	0% 0	0% 0	27
7	40.91% 9	27.27% 6	22.73% 5	9.09% 2	0% 0	0% 0	0% 0	22
8	34.78% 8	65.22% 15	0% 0	0% 0	0% 0	0% 0	0% 0	23
9	9.09% 2	45.45% 10	31.82% 7	9.09% 2	4.55% 1	0% 0	0% 0	22
10	54.55% 12	31.82% 7	9.09% 2	4.55% 1	0% 0	0% 0	0% 0	22
Total Views	91	124	50	22	1	2	0	290
Percentage	31%	43%	17%	8%	0.3%	0.7%	0	

Summary of Statement: I prefer looking at this Story to reading Scientific Data on the Environment

Story No.	Strongly Agree	Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Total
1	36.36% 20	30.91% 17	20% 11	5.45% 3	3.64% 2	3.64% 2	0% 0	55
2	35.48% 11	29.03% 9	19.35% 6	9.68% 3	3.23% 1	3.23% 1	0% 0	31
3	23.53% 8	32.35% 11	29.41% 10	11.76% 4	2.94% 1	0% 0	0% 0	34
4	27.59% 8	55.17% 16	6.90% 2	6.90% 2	0% 0	0% 0	3.45% 1	29
5	32% 8	48% 12	4% 1	12% 3	4% 1	0% 0	0% 0	25
6	62.96% 17	25.93% 7	7.41% 2	3.70% 1	0% 0	0% 0	0% 0	27
7	45.45% 10	40.91% 9	13.64% 3	0% 0	0% 0	0% 0	0% 0	22
8	39.13% 9	47.83% 11	13.04% 3	0% 0	0% 0	0% 0	0% 0	23
9	9.09% 2	63.64% 14	22.73% 5	0% 0	4.55% 1	0% 0	0% 0	22
10	31.82% 7	50% 11	13.64% 3	4.55% 1	0% 0	0% 0	0% 0	22
Total Views	100	117	46	17	6	3	1	290
Percentage	34%	40%	16%	6%	2%	1%	0.3%	

Summary of Statement: I prefer to receive Information from External Advisors and Experts

Story No.	Strongly Agree	Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Total
1	5.45% 3	18.18% 10	25.45% 14	21.82% 12	10.91% 6	18.18% 10	0% 0	55
2	9.68% 3	19.35% 6	29.03% 9	32.26% 10	6.45% 2	3.23% 1	0% 0	31
3	8.82% 3	17.65% 6	29.41% 10	29.41% 10	8.82% 3	5.88% 2	0% 0	34
4	6.90% 2	13.79% 4	17.24% 5	41.38% 12	17.24% 5	3.45% 1	0% 0	29
5	4% 1	20% 5	12% 3	44% 11	8% 2	12% 3	0% 0	25
6	25.93% 7	3.70% 1	22.22% 6	25.93% 7	11.11% 3	7.41% 2	3.70% 1	27
7	13.64% 3	18.18% 4	27.27% 6	31.82% 7	4.55% 1	0% 0	4.55% 1	22
8	8.70% 2	26.09% 6	8.70% 2	30.43% 7	4.35% 1	17.39% 4	4.35% 1	23
9	4.55% 1	18.18% 4	18.18% 4	31.82% 7	4.55% 1	22.73% 5	0% 0	22
10	13.64% 3	9.09% 2	18.18% 4	27.27% 6	4.55% 1	22.73% 5	4.55% 1	22
Total Views	28	48	63	89	25	33	4	290
Percentage	10%	17%	22%	31%	9%	11%	1%	

