Towards sustainability: case study of agricultural policy development in Scotland

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Abstract

This study thematically reviews agricultural policy papers affecting Scotland in the period 1998-2023, a period that started with the introduction of The Scotland Act (1998) and Scottish devolution, and ends with ongoing war in Ukraine. These two political events and numerous other political events have impacted Scottish farming. Politics have often been entwined with the key environmental factor, climate change to generate ideas on how to improve sustainability, a factor that is driving radical transformation in the agricultural sector. This paper builds a list of policy documents covering the stated period, before using a qualitative content analysis to identify themes on sustainability. The themes to emerge include; knowledge and skills transfer, environmental sustainability, climate mitigation, innovation, and food security.

A policy map indicates that these policy documents are both reflecting and shifting how sustainability is setting the Scottish agricultural agenda, but also politicians are invariably leading the conversation on sustainable practices through these various key themes. The paradox is that whilst policy appears coherent on paper, the reality is that implementation appears flawed. Farmers are encountering significant operational issues in trying to implement sustainable agricultural policies. Practically, this map of legislative themes will enable farmers to better understand these political expectations and consequently better identify gaps in their knowledge and skills in managing the transition towards sustainability. It is hoped this paper will help to adapt agricultural policy and improve farmers' support for sustainability, as ultimately agricultural policy needs the buy in of its definitive stakeholder, the Scottish farmer.

Introduction

UK farming, particularly Scottish farming has evolved significantly over the last twenty-five years due to technological factors (Mase, Gramig and Prokopy, 2017), as well as political events, such as BREXIT (Dace and Blumberga, 2016; Swinbank, 2016) and Scottish devolution (DEFRA, 2008); but arguably the most significant factor has been environmental (Batáry et al., 2015; Hallam et al., 2012). A factor that is seen as potentially the most harmful to humanity (United Nations (UN), 2016). A consequence of this fear has been a drive to identify the causes of environmental damage. Agriculture has been identified as a key a cause (Arora and Mishra, 2019; Mohammed, 2020; United Nations (UN), 2020). Consequently stakeholders have demanded agriculture becomes more sustainable and have sought to enforce this change through significant legislation and regulations (Rojas-Downing *et al.*, 2017). The result has created substantial operational issues for farmers. Farmers understand they are legally required to comply; however, the reality is farmers are struggling to implement these expectations and therefore the Scottish government's drive towards net zero faces difficulty. Numerous countries have promised at various gatherings e.g. COP26 and in various political statements e.g. The Scottish Government Net-Zero Greenhouse Gas emissions (GHG-E) to control climate change, perhaps the most influential is The Paris Agreement (2015) requiring nations to restrict global temperatures rising by more than an additional 1 ^{o}C this century (UNFCCC, 2015; Wollenberg *et al.*, 2016). A critical element in achieving this aim is changing agricultural practices.

Agriculture's technological advances have helped to feed and sustain a global population that has more than tripled in a hundred years (Ritchie, 2017), but these advances have impacted the

climate and created concerns about sustainability. Therefore, farmers across the globe have had to adapt and will have to continue to adapt their practices to meet sustainability targets, for instance changing crop type (Adams *et al.*, 1999). Data indicate that the food sector accounts for approximately 22% of total Greenhouse Gas emissions (GHG-E) (Arora and Mishra, 2019; Mohammed, 2020; United Nations (UN), 2020), a figure in line with Vermeulen, Campbell and Ingram's, (2012) estimated range (19-29% total GHG-E). Globally, the livestock sector, including beef production is the largest contributor of GHG-E, a reflection of rising livestock demand which in turn reflects rising global living standards (Gerber *et al.*, 2013; Opio *et al.*, 2013; Ripple *et al.*, 2014; Wollenberg *et al.*, 2016). This trend has environmental implications both globally and more locally, for example, The World Wildlife Fund Scotland (2020) suggests Scotland's farmers will have to reduce their GHG emissions by 31% by 2032 to meet this national/global challenge.

It is therefore evident that greening the economy requires incentives, rewards and punishments to encourage or force farmers to embrace sustainability (FAO, 2012; Gerber et al., 2013). Within a Scottish context, the Scottish Government in August 2021 opened a consultation entitled *Agricultural Transition in Scotland*. GHG-E mitigation is central to this strategy. The strategy has consulted widely, as the Scottish government bids to meet its sustainability targets. This strategy includes regulations covering genetically modified (GM) products, pesticides, carbon footprint, soil health, environment, livestock, as well as reducing agricultural subsidies. The reality is that farmers are struggling to meet all these requirements, because they cite confusing and contradictory strategic demands. The outcome is that farmers find themselves unable to navigate or understand the legal necessities sought by stakeholders, notably politicians. A particular concern for beef and dairy farmers is they strategise around a three year cycle, correlating from suckler cow conception to a replacement heifer birthing its own calf (SRUC, 2021). In addition, promised regulations designed to aid sustainability have been either delayed repeatedly or cancelled; examples include respectively the introduction of cattle electronic ear tags and the funding of environmental projects, such as hedgerows. This results in government policy being called into question, yet part of the new agricultural transition developments is predicated on more government intervention for example the whole farm plan(*Preparing for Sustainable Farming (PSF)*, (Scottish Government, 2020;Scottish Government 2023)

Farmers require clear information and education on GHG-E mitigation with practical costed long-term initiatives on adapting environmental and economic agricultural practices if they are to operationally and strategically meet sustainability targets. At present such clarity and funding is unavailable. The concern is whether policy is being published in a coherent way that supports farmers in Scotland with understandable guidance and achievable transition timelines. The worry is Scottish farmers will struggle to achieve sustainability, because political thinking and action is flawed.

Farmer Behaviour and Engagement with Policy

Overall, the research identified UK literature was limited in relation to farmers' attitudes and perceptions towards GHG-EM. The outputs were also characterised by their diversity. It revealed the issue had been examined in terms of geography, farm size and typology, as well as farming cultures. These variables reflect the multifaceted, heterogeneous nature of the farming community, but given the small number of published studies and the farming community's heterogeneity it highlights more research is required on farmers' attitudes and perceptions of GHG-EM. This is potentially problematic given the Scottish government's transformational agricultural GHG-EM policies are dependent on farmer engagement (SRUC, 2020; DEFRA, 2021; Scottish Government, 2021), including

its key Agricultural Environmental Schemes (AES). Data reveals farmers' willingness to participate in Agricultural Environmental Schemes correlated to their age, education, as well as their views on risk, diversification, succession planning and change (Burton, Kuczera and Schwarz, 2008; Sutherland and Burton, 2011; Lastra-Bravo *et al.*, 2015; Riley, 2016b; Riley *et al.*, 2018; Cusworth, 2020; Cusworth and Dodsworth, 2021). This was consistent with Smith *et al.*, (2020) who identified similar moderating influences on a farmer's entrepreneurial orientation.

Nonetheless, the literature unearthed little on farmers' attitudes and perceptions towards greenhouse gas emissions, although one recurring theme emerged, irrespective of the research focus: finance. The evidence indicated the higher the financial dependency on farm income, the less likely farmers would participate in AES (Lastra-Bravo *et al.*, 2015; Can, 2020). Cusworth (2020) maintained that achieving an economic viable unit is the farmer's `prime objective'. Furthermore, research reveals the strongest impact on farmers' entrepreneurial behaviour are economic factors (Can, 2020). Other studies, however stated a lack of economic incentives was not necessarily an adoption barrier to AES (Schroeder *et al.*, 2013; Riley, 2016a; van Dijk *et al.*, 2016), but did highlight farmers needed to balance financial aspects with environmental demands (van Dijk *et al.*, 2016; Gatto, Mozzato and Defrancesco, 2019; Coyne *et al.*, 2021). Research indicates farmers proffer differing opinions on GHG-EM financial and environmental benefits which sways farmers long or short-term participation in AES (Schroeder *et al.*, 2013; Lastra-Bravo *et al.*, 2015; Riley, 2016a; Mills *et al.*, 2018). Kuhfuss *et al* (2016) maintained a conditional collective bonus, nudged additional farmer participation through neighbours' societal expectations. Ultimately, Schroeder *et al.* (2013) contended that AES participation related more to a farmer's age, farm size and the farm's good environmental status, rather than funding.

Conceptualising the Farmer

The literature revealed all the qualitative studies, except Lastra-Bravo *et al* (2015), discussed social standing and reputation using the `Good Farmer' concept and Bourdieu's Social Theory (Bourdieu, 1977). Their findings noted farmers `judged' their neighbours for their farming management practices and environmental performance. These studies showed, with the exception of Feliciano (2014), that farmers were more likely to participate in GHG-EM schemes if it increased social capital, but they also acknowledged that AES success encouraged participation (Burton, 2004; de Krom, 2017; Wynne-Jones, 2017). Nonetheless, some studies identified farmers were unwilling to co-operate with collective AES schemes, because cooperation and collaboration often means sharing sensitive business information that most farmers do not wish to reveal e.g. debt (Burton, Kuczera and Schwarz, 2008; Riley, 2016a; Riley *et al.*, 2018; Coyne *et al.*, 2021). The factors involved in the farmers' thinking included the ad-hoc nature of farmer inter-cooperation, own farmland focus, fear of an imbalance between offering and accepting help which may affect social capital (Riley, 2016a; Riley *et al.*, 2018). The theme of social cooperation appeared in some research as an emergent process. This theme considered the issue in relation to the importance of a farmer's identity with their land, their neighbours' land management practices and the impact of climate (Wynne-Jones, 2017; Gatto, Mozzato and Defrancesco, 2019; Sutherland and Calo, 2020), all of which were noted as important in GHG-EM (Stringer *et al.*, 2020). The studies reveal that more research is required using Bourdieu's social theory concept of the `good farmer', using it as a lens to explore practices of social relatedness and the emergent influences with farmers (Sutherland and Burton, 2011; Wynne-Jones,

2017; Cusworth and Dodsworth, 2021). The studies also touched on the changing nature of farmer relationships through the concept of the 'Good Farmer', as farming practice becomes more technology and science driven (Sutherland *et al.*, 2012; Riley *et al.*, 2018). The current turbulence and `step changes` impacting agriculture will undoubtedly again alter the concept of what is a `good farmer'. This doctoral research will explore farmers' attitudes and perceptions and could provide an insight into these emerging relational and conceptual changes.

Exploring the Generational Differences

It appears farmers' attitudes and perceptions are often bound up with educational background, motivation, farming knowledge and skills and often reflect generational variation (Sutherland and Burton, 2011; Schroeder *et al.*, 2013; Lastra-Bravo *et al.*, 2015; Mills *et al.*, 2018), a feature notably evidenced in attitudes and perceptions towards risk and innovation, particularly a desire to change traditional practices (Feliciano *et al.*, 2014; R. P. ; Kipling *et al.*, 2019; Cusworth and Dodsworth, 2021). This generational gap also appears to characterise a farmer's attitude and perception towards AES. It is important to note the Scottish farmer's mean age is 60-years old (Rural & Environmental Services, 2019). No British studies to date have examined this generational perspective in terms of farmers' perceptions and attitudes towards climate change, greenhouse gases and emissions. Intriguingly the UK government `Path to Sustainable Farming` (Defra, 2020) recognised this generational issue and had agreed funding, partly to help older farmers retire who they saw a potential barrier to change. However, this funding has now ceased, whilst Scotland has never offered it.

Generational issues reflect the industry's lack of professionalisation, too often farmers' attitude centre on the belief that being a farmer is shaped by being born, raised and working on a farm to the exclusion of structured education. Nonetheless informal education and/or farmers' skills and experience have appeared as consistent factors in GHG-EM adoption because it acted as a vehicle for `bonding social capital' (Burbi, 2016) and raising awareness (Cusworth, 2020). Generally, the research studies have identified that a farmer's knowledge and skill-set affects environmental practices and a willingness to participate in GHG-EM (Feliciano *et al.*, 2014; Riley, 2016a; Riley *et al.*, 2018; Kipling *et al.*, 2019a; Cusworth and Dodsworth, 2021). This concurs with other research where a lack of information, knowledge and skills for undertaking AES resulted in risk avoidance, however it was noted this mindset changed following post successful GHG-MS participation (Riley, 2016a; van Dijk *et al.*, 2016). Professionalising the agricultural industry with life-long learning and clearer career development perhaps offers a more fruitful avenue for formally increasing and improving farmers' knowledge and skills to better transition to a sustainable farming future. Unsurprisingly, a lack of knowledge about climate change was identified (Feliciano *et al.*, 2014; Lastra-Bravo *et al.*, 2015; Hyland *et al.*, 2016; Kipling *et al.*, 2019a; Tzemi and Breen, 2019), often associated with age and education, but it also emerged that policy makers and providers had to better communicate how GHG-EM environmental benefited a farm (Burton, Kuczera and Schwarz, 2008; Hall and Wreford, 2012; Burbi, Baines and Conway, 2016; Kipling *et al.*, 2019b). The research indicates a disconnect between educational delivery and a farmer's need.

This disconnect translated into a lack of trust and support in government driven AES. Research revealed some farmers distrusted government and scientific advice on GHG-EM (Burbi, Baines and

Conway, 2016), instead farmers placed greater credibility and trust in projects where farmers and government advisers had collaborated and communicated meaningfully in developing GHG-MS (Kuehne, Bjornlund and Cheers, 2012; Riley, 2016a; Riley *et al.*, 2018). This process led many farmers to consider the information to be more trustworthy, practical and knowledgeable than that generated by scientists or government advisers (Burbi, Baines and Conway, 2016; Kipling *et al.*, 2019b).

Transition is indeed complex for the 'good farmer', a landscape littered with constant uncertainty, but for the farmer, new knowledge, new skills, different methods and systems is the trajectory towards sustainability, yet there is a lack of know how about what will be new and/or different. The result is navigating transition will be tricky for many farmers. We proceed with a detailed content analysis of current government publications to evidence our case that policy design and development is failing Scottish farmers in terms of supporting an understandable, inclusive accessible transition towards sustainability.

Methodology

The researchers sought to identify key sustainability markers in Scottish agricultural policies over the past twenty-five years using qualitative content analysis (QCA). This widely established approach seeks to marry the data collection process of quantitative research with the interpretive qualities of qualitative research. It has been used in numerous studies, including education (Gläser-Zikuda, Hagenauer and & Stephan 2020), nursing (Wiklund Gustin, Fredriksson, and Rakovshik, 2020) and farming (Broomfield, Nye and Wells, 2022). Its credibility rests on its integration of the respective strengths of quantitative and qualitative approaches (Kohlbacher, 2006). He argued its rigour allowed it to be applied to a range of material including text and video, furthermore he contends it better integrates the analysis into the research's findings and discussion. Qualitative Content Analysis is a long established, widely used coding tool, particularly favoured in an interpretivist paradigm. It seeks to preserve the advantages of quantitative content analysis through its systematic and structured approach to coding data i.e. text into categories and themes, but at the same time harness a more qualitative mindsight in the way it interprets the data. Duriau, Reger and Pfarrer (2007:8) suggest 'the implementation of content analysis varies considerably'. A feature Kohlbacher (2006) contends stems from different understandings, but also in the different ways it has been applied, ranging from Hsieh and Shannon to Mayring (Assarroudi et al., 2018).

Broomfield et al.'s (2022) study used QCA to explore how the UK media discussed migrant labour in horticulture. Their analysis argued that the Press focused on aspects that benefitted the economically powerful, rather than underlying socio-political root causes. Their study analysed the research problem from a UK perspective rather than this study's narrower focus on Scotland, nonetheless its use of QCA to analyse documents parallels our process. This study reviewed agricultural policy documents that have been introduced in Scotland over the period 1998 -2023, focusing in particular on agricultural policies that have or continue to have environmental, social and financial implications for sustainable, agricultural practices (Smith et al., 2020; Scottish Government, 2021; Segerkvist et al., 2021).

The researchers adopted Mayring's (2000, 2014) process, because of its clarity and established use (Gläser-Zikuda, Hagenauer and Stephan 2020). This process employs the research question(s) to categorise the subsequent literature unearthed, from which the researchers then seeks to develop guidelines for categories, 'anchor' examples and rules. Subsequently the researchers read the text to map examples onto categories. This step periodically involved revisiting the text and re-evaluating

the categories if required, before analysing and interpreting them to generate themes. Six themes emerged: knowledge and skills transfer; environmental sustainability; climate mitigation; financial support; innovation; and food security

Findings and Discussion

We constructed a large dataset (Table 1) from the publications available on the Scottish Government Website. The raw dataset evidences categories that the Scottish Government see as enabling a transition towards more sustainable agricultural practices, but it also highlights the uncertainties and challenges that face Scottish farmers, including the confusion reported by so many farmers in terms of this road map to sustainability. Qualitative Content Analysis enabled the researchers to categorise themes which suggest greater sustainability is linked to knowledge and skills transfer; use and protection of the environment; climate mitigation; financial support; innovation; and food security

Table 1: Summary of Result and Analysis

Policy/Strategy/Measure	Analysis	Categories
A National Test Programme to start Transforming Agriculture in Scotland National Test Programme from Spring 2022	Government recognises the need to do more with more urgency and to balance the needs of the whole industry – our national test programme will seek to do so with a twin track approach: TRACK ONE The purpose of Track 1 is to encourage farms to improve their knowledge of current environmental performance and efficiency. Support will incentivise businesses to engage with and adopt measures that will create a baseline of information and understanding in sustainable agriculture. This is an opportunity open to all farmers, crofters and land managers, to enable their businesses to gain an understanding of their own baseline at an individual farm level. TRACK TWO The purpose of Track 2 is to design, test, improve and standardise the tools, support and process necessary to reward farmers, crofters and land managers for the climate and biodiversity outcomes they deliver. This will create a robust understanding of how new conditions or activities could be applied to future support, and ensure delivery of environmental outcomes in a way that supports sustainable businesses. Track 2 will include detailed testing of more involved tools and advice that will establish a robust method through which farmers can record the benefits to climate and nature they deliver through their businesses. Once tested these can then be rolled out to all farmers and crofters. The Programme will begin in 2022 with a phased approach to rolling out measures for current recipients of farm support payments, with the aim that these measures will become a mandatory requirement for accessing support. This will enable the shift to at	knowledge and skills transfer; environmental sustainability; climate mitigation; financial support; innovation; and food security

	least half of all payments being made conditional within current payment schemes and will inform design of types and levels of conditionality in future payment schemes.	
The European Union (Withdrawal) Act 2018 (Withdrawal Act) and UK Withdrawal from the European Union (Legal Continuity) (Scotland) Bill (Continuity Bill)	The Withdrawal Act provides that EU-derived domestic legislation continues to have effect after EU Exit and incorporates directly applicable EU law into domestic law. Together, these will become 'retained EU law'. However, on EU Exit, retained EU law may stop having the desired policy effect or may not operate effectively. The parts of legislation which require correction to ensure the law continues to operate are called 'deficiencies. Deficiencies can be relatively simple references to EU law or an EU institution, or involve functions which previously rested with EU institutions which, where appropriate, now need to be transferred to either an authority in the UK or in the Devolved Administrations (DAs). The Continuity Bill similarly prepares Scotland's devolved laws for EU Exit.	knowledge and skills transfer; food security
Agriculture (Retained EU Law and Data) (Scotland) Bill 2020	The Bill creates powers that enabled Scottish Ministers to ensure the CAP continued post 2020 plus retain the ability to make improvements to the scheme following Brexit. It also improves the legal basis for collecting information about the agri-food supply chain and activities relating to agriculture. The Bill provides the legal framework to allow SG to act to streamline, simplify and free up resources to pilot and test activities likely to feature in a future farming and rural support policy beyond 2024.	knowledge and skills transfer; environmental sustainability; financial support; innovation; and food security
Retained EU Law (Revocation and Reform) Bill,	this represents an attack on nature, and on the devolved settlement itself. The legislation appears to want to row back 40 years of protections in a rush to impose a deregulated, race to the bottom on our society and economy. SG environmentally-principled approach of controls on polluting substances, ensuring standards for water and air quality, and providing protection for our natural habitats and wildlife are at risk from this deregulatory programme. Retained EU Law provides Scotland with a high standard of regulation. As we have repeatedly said, Scottish Ministers will continue to seek alignment with EU standards where possible and in a manner that contributes to maintaining and improving environmental protections.	knowledge and skills transfer; environmental sustainability; climate mitigation and financial support

Agriculture (Retained EU Law and Data) (Scotland) Bill	The aim of the Agriculture (EU Law and Data) (Scotland) Bill is to give the Scottish Ministers regulation-making powers to modify retained EU law related to the Common Agricultural Policy, in order to implement the proposals, set out in the 2018 public consultation "Stability and Simplicity", and to provide them with new powers to collect information relating to the agricultural and agri-food supply chain, which will help ensure greater transparency and stronger links to the principles of GDPR. It is expected to affect anyone in Scotland that currently receives support through the CAP. It is not intended to deliver a significant shift in policy, but rather pave the way through a transitional period to around 2024 after leaving the EU. The purpose of the Bill is to: 1. Provide the Scottish Ministers with the necessary powers to make changes in relation to the Common Agricultural Policy (CAP) Rules and Regulations which will become "retained EU law"1 after the UK exits the EU. 2. Provide the Scottish Ministers with powers to collect information, including information relating to agri-food supply chains. The Bill will enable the Scottish Ministers to implement proposals put forward in the 2018 "Stability and Simplicity" consultation2, described below, and other potential changes to the CAP rules that may be considered beneficial to Scotland's agriculture and rural economy. The Bill itself will not make any of the policy changes proposed in the consultation. These changes, once agreed upon, will be made through subsequent regulations under the then Act, which will be the subject of further impact assessments. The Bill will also provide the Scottish Ministers with updated powers to collect information about agricultural activities and agri-food supply chains.	knowledge and skills transfer; environmental sustainability; climate mitigation; financial support; innovation; and food security

Agricultural Transition in Scotland: first steps towards our national policy - Analysis of consultation responses 2022	85% agreed that agricultural businesses who receive financial support should be required to undertake baseline data collection, and 83% agreed that data should be collated nationally	financial support
A Future Strategy for Scottish Agriculture: Final Report by the Scottish Government's Agriculture Champions 2018	Four agriculture champions, with a remit to advise on the development of a new strategy for the farming sector in Scotland, warned that "new policies and mindsets" are needed to address the unprecedented challenges facing agriculture due to Brexit. Their vision is two-staged, based on what the public wants and values in Scottish farming, with stage one focusing on encouraging industry and businesses to become more entrepreneurial, and stage two concentrating on the continuation of basic income support at a lower rate	knowledge and skills transfer
Agriculture Bill 2023 (not passed yet)	The new Agriculture Bill must therefore provide the legal framework to deliver: • The Scottish Government's Vision for Agriculture; • The National Performance Framework outcomes; • Programme for Government and Bute House draft shared policy programme priorities; • Emissions and nature restoration targets; • Building on minimum regulatory standards; • Just Transition which supports agriculture, land integration and land use change in a way that follows the Just Transition principles; • Value for money; and • Broad alignment to EU CAP objectives.	knowledge and skills transfer; environmental sustainability; climate mitigation; financial support; innovation; and food security

Uncertainty is common place, including the period under review 1998 -2023. The last twenty-five years have seen all business and organisations learn, adapt and respond in agile ways to the opportunities and challenges facing them. Agriculture though is an unforgiving industry. It has long lead times, high capital investment and additional complexities such as climate shocks and unpredictable commodity markets. Therefore, it is evident farmers require a higher degree of certainty if they are to manage risk and innovate. This requires a clear understanding of Five questions: Why is it happening? Who is involved? What is required? When it is happening? and Where is it to occur? The appetite to know answers to these questions is significant, with so many Scottish farmers depending on payments systems and the need for payment to be coherent and timely (Schroeder *et al.*, 2013; Riley, 2016a; van Dijk *et al.*, 2016). The transition to more sustainable practices is against the back drop of national and global events such as BREXIT and the Ukraine war, therefore farmers more transparency, especially in the form of better, more coherent communication. Whilst certain political events have been unambiguously announced e.g. BREXIT (2016) and the UK's formal departure (2020) and the transition to Sustainable Agriculture in 2025, it is perplexing so little has been effectively addressed in terms of the Five questions. The Scottish Government informed farmers in 2018 that:

> *'The Scottish Government has set out proposals to replace the CAP up to 2023. There is no indication of policy beyond. In Scotland, basic payments will continue in 2018 and 2019. In 2020-2023 there will be continued payments for current recipients within the CAP architecture, with some possible changes, such as capping.' (Scottish Government, 2018)*

This broad communication disclosed very little and contained limited financial security in terms of retained payments spanning only five years. Further detail has singularly failed to emerge which is particularly problematic given the sector's long-term planning cycle and inherent weaknesses in many practitioners' skills, particularly around IT (Smith et al.2020). The Scottish Government announced in 2023 a further update on its key agricultural policy *Vision for Agriculture:*

> *'the ambitions set out in the Scottish Government's Vision for Agriculture, published in March 2022, Scotland will have a support framework that delivers high quality food production, climate mitigation and adaptation, and nature restoration.*
>
> *High quality, nutritious food locally and sustainably produced is key to our wellbeing – in economic, environmental, social and health terms. We will support and work with farmers and crofters to meet more of our own food needs sustainably and to farm and croft with nature.' (Scottish Government 2023)*

This communication is visionary and lacks detail. This is concerning since the transition deadline is two years away and farmers are expected to buy into a sustainability agenda which is based on an unfamiliar language (Feliciano *et al.*, 2014; Lastra-Bravo *et al.*, 2015; Hyland *et al.*, 2016; Kipling *et al.*, 2019a; Tzemi and Breen, 2019). QCA reveals that the publications lack specific information about financial payments and support for sustainable farming. Further evidence from the content analysis indicates policy makers are aware of shortcomings in the farmers skills and knowledge, yet there is little suggestion or action on how to educate these farmers to bridge this gap.

Despite extensive consultation, the Scottish Government delayed publishing a route map until February 2023 (see https://www.ruralpayments.org/topics/agricultural-reform-programme/arp-route-map/), furthermore analysis discloses little detail. Worryingly farmers are now aware there

will be new conditions introduced in 2025 and an enhanced payment structure in 2026, followed in 2027 by the launch of elective complementary schemes. Thereafter the metric based on performance and success designed to reduce agriculture emissions by approximately 30% and in line with The World Wildlife Fund Scotland's (2020) declaration. The content analysis highlights repeatedly in every publication a gap in farmers' skills and knowledge and the need to develop these skills and knowledge if transition is to succeed. Yet no detail is offered of how or when it will happen. These flaws make it difficult for farmers to navigate and plan. The new payments architecture requires famers to learn new administrative methods and understand new climate change language for example auditing and measure different types of carbon. Prior comments have highlighted the point that farmers have often disengaged in formal educational settings, instead relying on experiential learning. The difficulty for these farmers and ultimately government is that these educational gaps mean many farmers will struggle to administer processes, particularly in rural locations where weak broad band connections and inadequate online systems prevail (Wynne-Jones, 2017; Gatto, Mozzato and Defrancesco, 2019; Sutherland and Calo, 2020). Sustainable farming is a significant transition from traditional ways of running a farm business yet the groundworks to these processes have been tardily implemented, partially communicated and inadequately delivered through a medium which many farmers have yet to master. The evidence suggests farmers are having to engage in new ways of *being* a farmer, but it is one that poses a generational barrier for many (Feliciano *et al.*, 2014; Kipling et al 2019).

Analysis of the dataset identifies a number of emerging schemes covering aspects as diverse as forestry, climate change, and animal welfare will require technical competence. The concern is 'poor data in will mean poor data out', furthermore farmers who struggle to engage technically with these online platforms will risk losing payments and perhaps worse file inaccurate data. The potential for losses through a lack of skills and knowledge creates a threat to some family farms (Burton, 2004; de Krom, 2017; Wynne-Jones, 2017). Mairi Gougeon the Cabinet Secretary for Rural Affairs and Islands in an open letter stated recently (February 2023):

> *'Whilst the (Agriculture Reform) Route Map does not yet answer all the questions about the new support framework or provide the detail of how measures will be applied and what applicants will be paid, it does provide a clear set of programme dates to explain when current schemes will transition or end, and when more guidance, support and information will become available.*
>
> *The Route Map will be regularly updated to ensure that the most up to date information is available. If things change you will be told clearly and quickly' (Scottish Government 2023).*

This wording suggested that whilst government is aware of problems, its view seems mired in a reactive, rather than proactive approach to these difficulties. This transition potentially heralds a stressful era for many farmers in an industry already stretched and dealing with day to day uncertainties. It is essential the Scottish Government provides better leadership for an industry it regards as a critical component of the Scottish economy, yet to date its behaviours and actions demonstrate tardiness and inadequate responses to transfer detailed knowledge on how to implement sustainability within Scotland's farming industry. 'The good farmer' concept is about to be reframed and therefore future research must reframe what is stakeholders' understanding of the sustainable farmer. This repositioning requires better communication about funding, innovation, climate mitigation, support systems, the environment, and food to enable farmers to adapt and transition. (Burton, Kuczera and Schwarz, 2008; Sutherland and Burton, 2011; Lastra-Bravo *et al.*, 2015; Riley, 2016b; Riley *et al.*, 2018; Cusworth, 2020; Cusworth and Dodsworth, 2021)

Conclusion

Farming and its regulation have evolved significantly over the last twenty-five years and often dominated by what politicians wanted or thought what was wanted. This is currently manifest in its policies and practices designed to cut agriculture's carbon footprint. Already, there is an array of regulations on health and safety, pesticide use, control of movement of livestock, livestock identification, animal health, animal medicines use etc with inspections of premises and livestock to name but a few. The new legislative drive to improve farming or rather reduce the carbon footprint has produced a confusing vault of legislation and regulatory information which is often not fit for purpose in helping a farmer develop a sustainable strategy.

The Scottish Government over the last 5 years, as well as other groups not associated with Scottish Government have produced a range of climate change studies to consider what is necessary to become carbon neutral. The result is a wealth of information, often challenging to navigate and implement. For a farmer who is trying to do what is best for his land and his business there is little clarity as to what is the long-term plans which would benefit his business and financial sustainability. This complexity is exacerbated by other strategies and recommendations emanating from other parts of the UK. Key to the farmer's plans is who is the definitive stakeholder and what are their expectations? The concern is that as profitability declines, it becomes ever more reliant on subsidies, yet subsidies will reduce in the coming years and new schemes are conditional. This reality is leading to multiple often contradictory recommendations, consequently many farmers are unsure how to navigate a future in farming. To answer our research question, the raft of measures and consultation required to enable farmers to transition is less than three years away yet the conditions have not been detailed or communicated in a meaningful and timely way. This means farmers will struggle to adapt and transition to new conditional payments, particularly ones that require change is production methods and systems. This could prove especially difficult for the smaller family farm with little working capital. Additionally, the sustainability agenda such as carbon auditing, climate change, and environmental impacts aligned with a weak educational support package excludes many farmers from understanding how to transition. Overall policy design and development is failing in terms of supporting an understandable, inclusive accessible transition towards sustainability

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