

Farmers and bovine tuberculosis: contextualising statutory disease control within everyday farming lives

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DOI: <https://doi.org/10.1016/j.jrurstud.2017.08.009>



**Farmers and bovine tuberculosis: Contextualising statutory disease control within
everyday farming lives**

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ABSTRACT

Farmers are important stakeholders to be enrolled in national efforts to control and eliminate endemic livestock diseases by state veterinary authorities. Their co-operation (or otherwise) has significant influence on the success of statutory disease control efforts, and when accomplishment does not meet aspiration, farmers may be blamed by the state for perceived failures. Approaching disease control within a political ecology framework and using a qualitative social science investigation of bovine tuberculosis (bTB) in Northern Ireland as a case study, this empirical paper explores the rationales and sensibilities of cattle farmers and the agricultural political economy and regulatory framework within which they operate in this region of the United Kingdom. This is important for understanding the farming context within which bTB is located, and this context is a feature of the disease landscape which has been under-developed in the bTB literature to date. Examining the premise that farmers are part of the problem of bTB, and a link in the chain of explanation as to why the disease has not yet been eliminated from the region, the paper will trace what everyday life is like for farmers living with multiple uncertainties and indeterminacies in their farming presents and futures. bTB as a disease is but one important influence on their farming lives – there are competing others which attract their attention and employ their resources, often pushing bTB down the list of priorities, despite its substantial cost to the economy. It will also demonstrate that farmers are embedded within wider structures, particularly global markets and European Union regulatory regimes, which profoundly condition and shape their actions, often elucidating

resistance and a perceived loss of autonomy. A political ecology approach to investigating the complex multidimensional problems of First World agriculture, such as the effective control of endemic livestock disease in intensive production systems, is recommended if holistic interpretations and workable solutions are to be found and implemented.

Keywords

Bovine tuberculosis, Northern Ireland, Political ecology, Political economy, Regulation, Statutory disease control

1. Introduction

Livestock farmers must be foregrounded in any analysis of state-sponsored disease control or eradication efforts. They own the animals which succumb to infection; determine their husbandry and welfare; buy and sell them; present them for disease testing; and receive statutory financial compensation for affected animals. Farmers are the actors who regularly interact with veterinarians and state officials, and who comply with (or resist) the legislative basis and biosecurity practices recommended or enforced for disease control. Although much attention has been paid to the attitudes and behaviours of farmers in relation to disease, not enough, I would argue, has been paid to the farming conditions under which they operate, and which are likely to shape those attitudes. In taking a wider perspective, this paper investigates the political ecology of farming in relation to animal disease, incorporating situated, place-based knowledges, and illustrating the importance of what Tschakert et al. (2016:161) call the the 'lived experiences of people in day-to-day interactions with pathogenic landscapes'. In doing so the paper considers the example of one particular livestock disease – bovine tuberculosis (bTB) – and efforts to deal with its ongoing spread across cattle populations on farms in one part of the United Kingdom (UK) – Northern Ireland (N. Ireland).

Bovine TB has been the subject of state-sponsored eradication efforts in many parts of the developed world since the early twentieth century, but has been an economically-significant and politically-charged disease in the UK for all of that time (Atkins, 2016). N. Ireland has had a particularly high incidence of the disease over the last 30 years compared to other parts of Europe (Abernethy et al., 2006; Abernethy et al., 2013; Reviriego Gordejo and Vermeersch, 2006), with the annual herd incidence fluctuating between approximately 5 and 10% over the last 15-20 years with no stable incidence trend. Although there are inevitably parallels with other regions of the UK, especially those with high cattle density and a high incidence of bTB (such as the south-west of England), Northern Irish agriculture has some differences with the rest of the UK. This regional diversity has importance when analysing the socioeconomic context, epidemiology and governance of bTB. Given the relatively higher importance of cattle farming to the N. Ireland economy, the higher percentage of family farms, more fragmented landholdings, different state governance structures, higher stocking densities and levels of cattle movement, and higher overall incidence levels of disease over a more prolonged period of time when compared to Great Britain as a whole, there is merit in focussing explicitly on bTB in this region. This provides a regionally-nuanced appreciation of farmers and farming lives, set within what Blaikie (1995:14) calls the ‘larger, pervasive and often non-place-based political and ideational forces’ which impact these lives. Such an approach fits well with a multiscalar political ecology approach: there is a need for political ecologists to ‘analyse the historical and socioeconomic (or structural) context in which the *local* problem is situated, and ... to trace the links of causation to factors in the *wider* political economy’ (Thrupp, 1993: 51; *emphasis added*).

While there are undoubtedly ecological and technical reasons for the persistence of bTB in N. Ireland (Abernethy et al., 2006; Doyle et al., 2014; Doyle et al., 2016; O’Hagan et al., 2016a, 2016b; Skuce et al., 2010; Wright et al., 2015), socioeconomic and sociocultural factors

affecting the economies of cattle farming and its regulation by the institutions of the state are an important part of the 'chain of explanation' (Blaikie and Brookfield, 1987), emphasizing the need to combine natural and social science in the search for potential solutions. Within veterinary epidemiology and animal health research in general, the value of qualitative research investigating attitudes and behaviours of farmers is increasingly recognised. For example, studies examining mastitis control in dairy farming (Jansen et al., 2009), zoonotic disease control (Ellis-Iversen et al., 2010), attitudes to biosecurity in Johne's disease control (Benjamin et al., 2010), and the use of antibiotics (Moreno, 2014) all found that the attitudes and behaviours of farmers, including their knowledge of disease, had an effect on the intended outcomes of improved animal and human health.

The same premise can be applied to bTB, and human geographers in particular have focussed on the attitudes and behaviours of stakeholders involved in bTB control (farmers and vets) in England and Wales. With the state traditionally having framed the issue of bTB as purely a scientific and veterinary problem, Enticott has argued that the social and cultural aspects have been largely disregarded, to the detriment of disease control efforts (Enticott, 2008a). Enticott particularly focuses on biosecurity, the attempt to separate disease agents from animals in time and space (Enticott, 2008a, 2008b; Enticott and Franklin, 2009; Enticott and Vanclay, 2011). Connecting biosecurity and animal health policy, Enticott describes how this has become a key component of the state's strategy to regulate the flow of disease between and within agricultural enterprises, but finds that farmers have resisted such policies, dismissing them as unworkable (Enticott, 2008b). Farmers may therefore legitimize illegal badger culling as they seek to protect their herds from bTB, and emphasize the alienation which they feel from both scientists and the state due to the perception of unrealistic expert advice (Enticott, 2011). Vanclay and Enticott (2011) use script theory to discuss the routines, catch-phrases, narratives and lines of argument when farmers speak of the disease. Developing this further, they also demonstrate

that farmers value their own lay knowledge of bTB, and have a fatalistic view on disease striking their herd, in spite of state veterinary advice on biosecurity (Enticott, 2008a; Enticott and Vanclay, 2011). Likewise, Fisher (2013) describes how trust and confidence in the state in relation to bTB control is low, with farmers being unlikely to act on state advice concerning the protection of their herds from the disease, which may also be linked to their perception of, and attitude towards, risk (Naylor and Courtney, 2014). Maye et al. (2014) criticise the neoliberal approaches of the state to bTB control which fail to appreciate and incorporate the ‘narratives of nature’ which farmers particularly strongly hold on the control of the wildlife reservoir of the disease in the British Isles - the European badger. Cassidy (2012) analyses the framings of badgers in the UK media, and also the planning, aims and conduct of the Randomised Badger Culling Trial (RBCT) in England (Cassidy, 2015). Rather than focussing on biosecurity or badgers, other work has centred much more explicitly on the framings of the disease and the ontologies of the bacteria which cause it (Atkins and Robinson, 2013; Robinson, 2017).

Here I build upon these social science literatures of bTB to further explore why farmers may resist rather than actively co-operating with, the state, and why bTB control is just one aspect of farming life demanding attention – there are competing others. Alienation and isolation from the state is a feature of farming lives which comes to the fore partly because of EU subsidy inspections, and this ultimately affects state efforts to eliminate disease. But the pressures of falling milk prices, globalisation, bad weather, stress and sense of despair also play their part in a complex amalgam of factors which may either bring the disease and its consequences even more sharply into focus, or alternatively hinder elimination efforts by deflecting attention away from disease to other matters of more pressing concern.

2. **Blaming farmers for ongoing bTB spread**

How important are the attitudes and behaviours of farmers in relation to statutory disease control? Historically, Robinson (2015) has shown that praise was showered upon farmers by state authorities in N. Ireland when progress was made towards eradication in the early years of the statutory scheme which had started in 1959, but this changed to apportioning blame in the mid-1970s. An influential audit report (NIAO, 2009) described how a minority of farmers in N. Ireland had not complied with legislative requirements on bTB testing, or had been involved in fraudulent activity such as deliberately interfering with the skin test sites on animals to reduce or create skin swellings. The auditors called for more enforcement activity by the state to curb errant farmer behaviours which had been hindering progress towards eradication. A more recent state report on bTB in N. Ireland suggested that ‘the eradication of bTB in cattle ... cannot be achieved without constructive co-operation between government, industry stakeholders and individual farmers’ (DAERA, 2016), highlighting the lack of a current partnership approach without explaining why.

Taken as a whole, farmers are certainly being apportioned with blame when it comes to the failure to eliminate bTB in N. Ireland, but to varying degrees. This paper will present evidence from interviews with stakeholders involved in bTB control in N. Ireland, but two interviews excerpts are important at this early stage to prepare the ground for considering the issues which this paper investigates concerning the farmers’ role in ongoing disease spread and disengagement from state authorities. State vets felt that on the whole, most farmers complied with bTB legislation, even if they needed some ‘persuasion’ through the threat of subsidy penalties, but their biosecurity practices on farm left room for significant improvement, as one explained:

‘Biosecurity, I believe, is a significant issue. Most farmers are complying fairly well with the bTB programme in terms of presenting animals for tests. Our evidence is that most herd tests are done fairly speedily before the due date. We have systems which impose administrative penalties to farmers who don't test on time, which helps to encourage them to test on time. In terms of movement offences, yes, we have a scattering of movement control offences, which range from the accidental through to the blatant disregard, and we prosecute where evidence is found, certainly in the latter category ... So are farmers complying? Yes, I think by and large they are insofar as the statutory requirements are concerned. In so far as best practice is concerned, I think there's a long way to go - biosecurity etc.’ (Int A55, state vet)

But if farmers are to blame for the failure to eradicate the disease in N. Ireland, not everyone was sure. One private vet was more uncertain about the role of the farmer: ‘I used to think farmers were guilty, but now I'm not so sure [*laughs*] ...’ (Int A19, private vet).

Looking elsewhere in the world for success stories in the eradication of bTB, Australia's eradication of the disease by 1997 was reckoned to be due to the full co-operation and support of the farming industry (Radunz, 2006), implying that a failure to do so would have led to a very different outcome. Similar connections between farmer attitudes, behaviour and ongoing disease spread have been suggested in other countries where bTB eradication has proved problematic. In the United States, farmer resistance was a feature of the early eradication programme, and incentives were required to ensure co-operation, leading to disease-free accreditation by 1941 (Olmstead and Rhode, 2004). O'Connor (1986: 52-53) believed that a failure to eradicate the disease in the Republic of Ireland (ROI) had led to ‘almost a resigned acceptedness [*sic*] by some herd owners,’ and a lack of further commitment from both farmers and vets. He reported that vets testing cattle were being influenced by their farm clients to be lenient in their interpretation of the results, with diseased animals allowed to remain in herds rather than being removed for slaughter. According to another Irish researcher, farmers lacked an adequate appreciation of the infectious nature of bTB, and their role in practising biosecurity

and preventing the spread of the disease ‘could not be overstated’ (Collins, 2006: 373). Elsewhere in Europe, Moda (2006: 254) suggested that non-technical issues had hindered progress in bTB control in Italy with delays in reaching eradication meaning that ‘the initial co-operation among farmers can be replaced with mistrust and passive behaviour, if not open resistance’. A workshop of bTB experts from around the world concluded that better understanding farmer behaviour through further research was the most important step forward in moving towards the goal of bTB eradication (Kao, 2013; Author, personal observation).

Despite the undoubted commitment to farming, farming life has been a struggle for many farmers particularly in recent years, and this paper will conclude that unexpected or seemingly random disease incursions, particularly of bTB, are but one disruption to the state of equilibrium in farming life, if such a state exists. There are other hindrances, but also other opportunities attracting farmers’ attention: we must survey the wider scene to understand ‘the practice of everyday life’ (de Certeau, 1984) in cattle farming today, and agree with Messer (1987: 238) that ‘the structural forces underlying decision-making processes are as significant as the technical problems and solutions’. Although functioning independently in primarily family farms in N. Ireland, livestock farmers are part of a much wider network influenced by business and regulatory interests and frameworks, as Cox et al. (1986) stated more than 25 years ago, but still relevant in the UK today. For example, Singleton (2010: 249) quoted the sentiments a cattle farmer in England as follows: ‘Keeping the livestock alive is one thing. Keeping on the right side of DEFRA [*UK government department*], the Environment Agency, the taxman, that’s another’. There are certainly multiple and complex influences which co-produce farmers’ responses to policy and market signals and instruments both in the UK and internationally, as acknowledged by Haggerty et al. (2009) in the context of neoliberal reform of sheep farming in New Zealand, and Higgins et al. (2012) in relation to environmental land management in Australia.

If farmers are potentially partly responsible for the ongoing spread of bTB this should not therefore be viewed in stark isolation from the *context* in which farming takes place in N. Ireland, and this is much wider than a perceived failure to appreciate the necessity of biosecurity measures to keep infectious bacteria away from susceptible cattle. When investigating the ‘web of causation’ (Pfeiffer, 2013) of bTB, it is therefore important to examine the problem holistically and to go beyond a simple ‘political ecology of cause and blame’ (Stephenson and Stephenson, 2016). Apportioning responsibility without examining the wider background is overly simplistic: a political ecological view provides more appreciation of context.

3. Providing context: Political ecologies of agriculture and health

Farming lives are important in political ecology. In Blaikie and Brookfield’s ‘classical’ versions of political ecology (Blaikie, 1985; Blaikie and Brookfield, 1987), farmers (known as ‘land managers’) and their practices are central in their accounts of environmental degradation. For example, Blaikie (1985: 5) suggested a new approach to the problem of soil erosion involving a ‘place-based’ analysis of the problem, and particularly an examination of the ‘relations of production under which the land is used, the technology used and why, process, taxes and so on’. This provided what he called a ‘bottom-up’ approach where attention focused firstly on the smallest unit of decision-making for use of the land – the family farm – and then followed this up at different scales by looking at the village, and then the state. In doing so, Blaikie believed that this type of analysis looked at ‘where power lies and how it is used’ (Blaikie, 1985: 6).

Although Blaikie’s work was consistently focused on developing world contexts, there are parallels with farming in N. Ireland. Most farms in N. Ireland are family businesses with an emphasis on livestock production. Whilst full-time family farmers and their farms may act as

economic units aiming to maximise economic efficiency, many, particularly the significant part-time farming sector, are also culturally-embedded and more-than-economic with livestock farming as a lifestyle choice (Moss, 1986). Farmers 'know nature' through being brought up working with livestock and intimately knowing both the cattle and the land on which they graze. Their expertise in the field is passed from one generation to the next, with a lifelong culture of informal, embodied and experimental learning practised and performed by many. In that regard they will not differ much from the 'land managers' whose performances political ecologists have studied in developing world contexts (Batterbury, 1996; Ramisch, 2011).

While the multi-million pound Northern Irish dairy and beef industries may seem far removed from the peasant farmers of the global South, the gap may not therefore be as wide as one might first imagine. Indeed, there are interesting parallels. Van der Ploeg (2008: 274) argues that the peasant principle 'stresses the value and satisfaction of working with living nature, of being relatively independent, of craftsmanship and pride in what one has constructed. It also centres on confidence in one's own strengths and insights'. But with constant uncertainties of climate and markets, a treadmill of work and regulation, and a loss of autonomy, arguably many European farmers are caught up in what van der Ploeg (2010:1) calls the global 're-emergence of the peasantry' or a 'repeasantization' (van der Ploeg, 2008: 7), which he claims is happening just as much in the developed countries of Europe as in the developing countries of the rest of the world. In this way, farmers become 'citizens of Empire' (van der Ploeg, 2008). Under control and regulation by a powerful conglomerate of wider national and global interests, and enrolled in a 'struggle for autonomy and space', van der Ploeg predicts this will become a global phenomenon in agriculture.

Galt (2013a: 639) thinks that capitalist agriculture remains 'a fairly minor topic in First World political ecology literature, especially vis-à-vis third world political ecology', and notes this absence as 'curious'. Galt (2016) argues the merits of examining the role of the state in state-

farmer relationships, in addition to exploring extra-regional influences and impacts on local agri-food systems. Viewing livestock agriculture in N. Ireland through the interpretive lens of a First World political ecology adds to this research field, and provides a novel approach to examining bTB control. Examining animal disease within its wider socioeconomic context also contributes to, and develops, the expanding literatures of a political ecology of *health and disease* (King, 2010; Guthman and Mansfield, 2013; Jackson and Neely, 2015; Connolly et al., 2017), some of which have considered agricultural landscapes, albeit urban ones (Nyantakyi-Frimpong et al., 2016; Connolly, 2017) rather than rural (Robinson, 2017), and which focus on human rather than *animal* health.

4. Methodology

This paper provides qualitative narratives of bTB to conjoin the normatively ascendant statistical and quantitative perspectives on state disease control policy. According to Leach and Dry (2010: 5), ‘narratives – in constructing disease issues in particular ways – frequently also construct people and populations, labelling and making moral judgements about them’, meaning that they are also ‘intertwined with issues of power and social justice’. A hallmark of political ecology is the deconstruction of ‘grand narratives’: challenging prevailing wisdoms (Leach and Mearns, 1996); and debunking myths, particularly where the marginalized have been accused of ‘ignorance’ (Dove, 1983). Investigating narratives often involves looking at the present in the context of the past (Davis, 2009). Whether the narratives are centred on desertification of the Maghreb (Davis, 2007), deforestation in West Africa (Fairhead and Leach, 1996), or global disease epidemics (Dry and Leach, 2010), political ecologists have succeeded in ‘wielding the intellectual hatchet’ (Robbins, 2012: 98) to prevailing narratives to reframe them (e.g. Fairhead and Leach, 1998). This is particularly appropriate for subject areas which are uncertain or controversial, and where rhetoric and myth abounds in relation to disease (Craddock, 1995; Roe, 1989; Tadros, 2010).

Narratives are used in everyday life and in policy making as a way to '[make] sense of an uncertain, complex and contested world' (Blaikie, 2009: 4). How a disease narrative is framed of course depends on the vantage point: 'Within alternative narratives, the dynamics of a given disease, what counts as a problem, and to whom, can vary greatly' (Leach and Dry, 2010: 5). As Hajer (1995: 63) asserts, 'story-lines fulfil an essential role in the clustering of knowledge, the positioning of actors, and, ultimately, in the creation of coalitions of actors of a given domain'. Particularly fitting within a political ecology framework, with its emphasis on the concept of marginality (Watts and Peet, 2004), are narratives from the fringes – those whose voices may not otherwise be heard. Seen from that perspective, new storylines are useful political devices which can overcome fragmentation and promote unity between the actors on a given stage (Hajer, 1995).

bTB has its own stock of narratives and 'commonplaces' (Myers and Macnaghten, 1998) on the disease and its causation (Robinson, 2017). As we have already reviewed, these tend to be reductionist, and based on accusation and denigration: blaming farmers and their lack of attention to 'good' biosecurity practices; blaming badgers; or blaming state veterinary authorities for their failure to administer a 'successful' programme. In this way, moral judgements and accusations can be made and targeted at various levels and actors within the bTB network. There is a need for the creation of new storylines and a holistic reframing of bTB eradication with a much more nuanced appreciation of underlying context. Barnett and Blaikie (1992: 69), in their study of AIDS in Uganda, argue that it is not enough just to look at risky behaviours in terms of disease spread, but a more holistic approach necessitates 'an understanding of the social, economic and historical factors that have produced this particular spatial distribution of risk'.

Qualitative methodologies in geography such as interviewing and focus groups (Crang and Cook, 2007) provide ways to construct explanations and potential solutions to complex

socioeconomic problems, for *people* are at the centre of bTB eradication efforts. The research findings described in this paper are derived from 60 in-depth, semi-structured interviews with farmers, vets (private and state), policymakers and other industry stakeholders involved in the Northern Irish bTB eradication programme. Findings from a focus group of state vets are also included. These actors in disease control were interviewed by the author in late 2012 – early 2013 to understand why the disease had not yet met its original objective of eradication of the disease from the cattle population of N. Ireland. The emphasis was on interviewees providing their own experiences of farming and bTB as lived realities, thereby constructing narratives of the everyday. The farmers (n=47) were purposively selected through personal and professional contact networks and farming and veterinary gatekeepers to provide a range of dairy and beef farmers with different herd sizes and experiences of bTB. The overwhelming majority were employed full-time in farming. The farmer and private vet interviews were concentrated in Counties Antrim and Down in the east of N. Ireland, mainly in two state veterinary administrative divisions - Ballymena division (traditionally lower bTB herd incidence - 5.19% in 2012 – lowest in N. Ireland), and Newtownards division (traditionally higher bTB herd incidence - 11.32% in 2012 – highest in N. Ireland). All of the interviews were fully transcribed using *f4* transcription software (audiotranskription.de), and coded in *NVivo* software (Version 9; QSR International Ltd.) using a grounded theory approach for analysis (Knigge and Cope, 2006; Glaser and Strauss, 2008).

The following sections describe the farming lives of farmers mainly as they see it – their narratives – but there are also perspectives from vets and a Farmers' Union representative. These narratives analyse the socioeconomic landscape within which bTB is placed, and demonstrate how bTB outbreaks are but one pressure bearing in upon farmers in their everyday lives on the farm. bTB control may not necessarily therefore be their sole, or most important, focus, despite the significant cost to the national economy.

4. Farming lives

4.1 Halcyon days in cattle farming

Agricultural production and the agri-food industry are arguably the lifeblood of N. Ireland's economy, and are also at the centre of its cultural economy. A legacy of farming runs down through the generations, and the majority of the Northern Irish population are either directly involved in the industry or are only a few steps away from the land through familial networks. Central to that agricultural economy is the rearing of livestock, with the high average rainfall and the topography of the land ideally suited to growing grass - Ireland was not poetically named 'The Emerald Isle' by William Drennan (1754–1820) without good reason. The importance of agriculture has been recognised while targeting the growth of the agri-food industry (Agri-Food Strategy Board, 2013).

N. Ireland had a cattle population of 1.59 million animals in 20,201 herds in 2012, and cattle farming is the main agricultural activity (DARD, 2013). There are around 16,000 full-time and 13,000 part-time farmers in N. Ireland, with the majority of these involved in the dairy, beef and sheep sectors (DARD, 2014). The overwhelming majority (96%) of full-time farmers are male, but in addition to the females whose full-time occupation is farming, there is a perhaps under-recognised informal economy of farming spouses and children who work on farms in a supporting capacity, often doing bookwork and helping with practical tasks such as milking and feeding as required. Almost all farms in N. Ireland are owned and operated by owner-occupiers or partnerships between family members (DAERA, 2016). Farming very much remains a family affair, and the family farm is 'far from dead' (Brookfield, 2008).

This predominance of the family farm typical of N. Ireland dates back to changes in land legislation in the 19th century when land was transferred to sitting tenants and absentee landlord systems were abolished (Moss, 1986). This landscape has been changing for some time: farms

are becoming larger and fewer in numbers as farming, particularly dairy farming, becomes more intensive and specialized. The days of keeping cows, sheep, pigs, chickens, and growing potatoes and barley all on the same holding have largely gone. There still remains a sizeable number of part-time farmers who work off-farm, keeping mostly beef cattle as part-business, part-hobby, carrying on the legacy of past generations.

When interviewed, older farmers spoke wistfully of a previous time when life on the farm in the 1950s and 1960s was lived at a slower pace, and when there was more time to enjoy the fruits of labour. Although there was hard work aplenty, and much of that manual and physically demanding, there was a strong sense of happier times with less stress and pressure, and particularly much less regulatory burden. There was also reminiscence about the halcyon days of the 1980s and early 1990s when input costs were low and profit margins were high in both dairying and beef production. Many bought land during this period to expand their cattle enterprises and introduced new mechanised milking parlours, and some had been able to service their debts with relative ease even with interest rates of up to 18.5%, paying off loans ahead of time. Even the weather used to be better:

‘We have worked with bad prices over the years, but I look back on summers when it was a privilege to be in farming - you wouldn't have changed places with the Queen. If the weather would get better ... but again, that's out of our hands.’ (Int A13, dairy farmer)

Benefiting from a strong state-sponsored productivist ethic backed by favourable income and price support conditions which created the butter and beef mountains of unwanted produce in the European Economic Community (EEC) (Grant, 1997), farmers ‘made hay while the sun shone’, and these were spoken of as the best times to be in farming, particularly by dairy farmers.

But the generous subsidization of production by the EEC was not to be sustained. The introduction of milk production quotas in 1984 and reforms in the Common Agricultural Policy (CAP) subsidy regime, introduced with the explicit aim of limiting production, changed the farming landscape, but not always for the worse. Despite such subsidy reforms, production in N. Ireland continued to expand, and the quota itself became a valuable capital commodity which could be profitably traded (Kirke, 1989). Dairy farmers took advantage of declining milk production in the rest of the UK to buy excess milk quota, allowing them to further expand milk output. Similarly, cattle herd sizes increased through the 1990s, particularly in the beef suckler sector, as farmers found ways of working a supposedly production-limiting subsidy system to their financial advantage (Robinson, 2006). The dairy industry expanded in scale and became more efficient, with average herd size increasing from 33 cows in 1983 (Kirke, 1989) to 82 cows in 2013 (DARD, 2013), and average milk yields increasing from 4,603 litres/cow in 1982-83 (Kirke, 1989) to 7,190 litres/cow in 2013 (DARD, 2014). Fewer farms now keep more cows, and those cows produced 1.98 billion litres of milk in 2013 at a market value of approximately £628 million (DARD, 2014). The equivalent market output for beef cattle in 2013 was £413 million (DARD, 2014).

The impact of Bovine Spongiform Encephalopathy (BSE), particularly after 1996, had very serious ramifications on cattle farming. The EU's drive to assure European consumers of full animal traceability and food safety in the wake of the BSE crisis dramatically changed the culture of regulation in animal production. With the introduction of the Single Farm Payment (SFP) subsidy system in 2005 (EC Regulation 1782/2003), a new regime of inspection and cross-compliance between environmental protection of the land, the health and welfare of animals, and the assurance of food safety was introduced, much to the distaste of many of the farmers interviewed.

4.2 *Global markets and productivism*

Farmers were conscious of being part of an industry and a market which reached far beyond the shores of N. Ireland's coastline. Watts and Goodman (1997: 3) state that 'the food economy is increasingly driven by global demand and internationalization of the agro-food industry', and Woods (2013: 113) goes so far as to suggest that 'globalization is arguably the most prevalent force reshaping rural localities around the world today'. The trend of the late 1990s has continued unabated, and farmers, particularly dairy farmers, were very conscious of their place in a *global* market for milk and beef and with that the volatility and uncertainty that world commodity trading brought to their local industry:

'Well, to spend £1M on a set-up for dairying - (*laughs*) I think it's a big risk, because milk is a world market now, and we are depending on someone else's disaster so that we get a price. New Zealand affects us ... in New Zealand there's [recently] been a drought.' (Int. A13, dairy farmer)

Whilst the farmers wished no ill on their peers elsewhere in the world, drought in New Zealand (NZ) brought hope in N. Ireland; a shortage in one place afforded opportunity in another. Several others also spoke of NZ's dairy industry, the largest exporter of dairy commodities in the world, and their focus on how markets in the Pacific affected their returns and profit margins in the north-west corner of Europe. Using the internet to keep in touch with trends in milk prices in NZ, farmers were able to project their own financial returns in forthcoming dairy auctions in the UK; one appeared to follow the other. They also saw NZ, although it has a much bigger dairy industry, as their main competitor in global markets:

'The world's a small place now. NZ, even though it's on the other side of the world, is a big problem to us, trying to keep ahead of them or trying to keep abreast of them.'
(Int A24, dairy farmer)

In both jurisdictions there is an almost complete reliance on the export of the milk and milk products produced. Like the NZ dairy industry (Jay, 2007), there remains a very strong focus

on increasing production, production efficiency, and expanding market share amongst N. Irish farmers.

However, the focus on markets was not just at the global level; there was also a focus on the EU, with changes in subsidy and quota regimes changing market conditions, particularly with the abolition of milk production quotas on the horizon in 2015. The neighbouring Member State – the ROI – was therefore seen as a threat if, as expected, Irish farmers took the opportunity to expand production without the constraints of quotas, and risking over-supply in competition for similar markets. On a different scale, UK retail supermarkets were seen as being a major determining factor in prices for beef and milk, and there was frustration that farmers lacked bargaining power and had to settle for being price takers. Added to the mix were the milk processors, and after a period of relative stability and unity there was now increasing fragmentation amongst farmers regarding who they decided should purchase and process their milk. Such is the modern complexity of world dairy markets: the global becomes the local, and global trade networks produce a rescaling of markets through a form of ‘glocalisation’ (Swyngedouw, 2004).

On the beef side, the mood was much more depressed than that found amongst dairy farmers. Beef prices were at a low point in N. Ireland in late 2012, and input costs had increased rapidly, dramatically squeezing profit margins. Prolonged periods of wet weather had also reduced forage supplies. Efforts were being made to cut costs, and there was a sense of despair and helplessness because of matters beyond their control. Considering the future, one beef farmer echoed the views of others:

‘I would be gloomy about it. I would be gloomy because we can't control our end price - between the supermarkets and the meat plants ... Our input costs have become colossal, and the weather is another major hazard. If we get a few more years like this one there will be a lot less stock, because people have housed cattle in July and August, and they don't have enough silage, and they are buying more and more concentrate, and

it is more and more expense ... Farmers are making a gross profit from suckler [beef] cows, but once you look at the net profit, very few farmers are in a positive situation.’
(Int A53, beef farmer)

Despite the uncertainty about the future and instability in the markets, dairy farmers were on the whole optimistic about the future, and many had invested heavily in new technology such as robotic milking machines and more technologically advanced milking parlours, and had expanded their herds to produce more milk more efficiently at greater scale. Land was stocked to near maximum efficiency, and acquiring new land was seen as the most limiting factor to production.

Lowe et al. (1993: 221) defined productivism as ‘a commitment to an intensive, industrially driven and expansionist agriculture with state support based primarily on output and increased productivity’. Living with constant volatility appears not to have restrained the productivist instincts of the Northern Irish farmer, and the countryside continues to bear the traits of an industrialized space (Bowler, 1985), albeit one that is now highly regulated through health, welfare and environmental protections. Whilst O’Connor (1993) thought that a ‘sustainable capitalism’ was not possible, the farmers I interviewed would probably disagree; but they certainly had to work harder to transform the materialities of nature into profit. As with the farmers surveyed by Walford (2003) more than a decade ago in south-east England, productivism in N. Ireland is alive and well. Its death was prematurely declared, as others have previously argued (Evans *et al.*, 2002), but this comes with a human cost. Coping with bigger herds, more land, and higher input costs, fourteen-hour working days with one week off per year and pressures on profitability were commonplace on dairy and beef farms. If labour was being exploited on family farms, it was surely ‘self-exploitation’ (Galt, 2013b), as one beef farmer described: ‘Everybody is going like the hammers, like a cat chasing its tail’ (Int A1). Many, it seemed, were still firmly attached to the ‘agricultural treadmill’ (Ward, 1993). As Pile

(1990: 136) found with dairy farmers in Somerset, England, even in the 1980s, ‘the reproduction of the family farm is becoming “harder and harder” and they are beginning to wonder where this work treadmill will take their farms’. These farming trends are therefore long-term, and jumping off the treadmill does not appear to be an option. Speaking of the frustrations of dairy farming, one young farmer said:

‘You have invested a *pile* of money, and you need to keep investing, and at the minute you are really just scraping through - you haven't money to re-invest really ... You'll always get those few boys at the top that are doing really well; then there's the average. If you can push yourself towards the top there's more money to be made.’ (Int A8, dairy farmer)

The work ethic is very deeply ingrained, along with a stoical determination not to be defeated. But despite this determination to succeed, maximising profit is not the sole motivation, and the farming *lifestyle* is very important to farmers. As Howley et al. (2014) note, ‘it’s not all about the money’. Family farming is more complex than that:

‘Farming is much more than an occupation: it is the reproduction of the family; it is work; it is their public role; it is their social status; and, it is their self-image. These multiple layers of meaning combine in such a way that the work of farming becomes an end in itself and survival its own logic’ (Pile, 1990: 160-161).

But farmers, on the whole, loved what they did, despite the hard work and often severe pressure to increase profit margins in an intensely competitive global market.

4.3 Paying the price for subsidies

Science, numbers and technology have been increasingly used by state and supra-state regulatory bodies to govern farmers in their management of land and livestock (Lowe et al., 1997; Jokinen, 2002; Singleton, 2010; Singleton, 2012; van der Ploeg, 2008) in return for

subsidy payments and the ‘right’ to farm. Direct government intervention in agricultural economies is a feature of food production in countries around the world through direct or indirect support, and this has been the case stretching back thousands of years. The fundamental principle of agricultural support in the EU was established through the Treaty of Rome in 1957 which founded the European Community (EC, 2002), with Articles 33-39 forming the *Common Agricultural Policy* (CAP). CAP spending in the EU used some 44% of the total EU budget in 2011 (European Commission, 2013), and is therefore a very significant proportion of overall EU expenditure.

Direct subsidy payments are made to farmers which are ‘linked to compliance with rules relating to agricultural land, agricultural production and activity’ (EC, 2003), but non-compliance means that ‘Member States should withdraw direct aid in whole or in part on the basis of criteria which are proportionate, objective and graduated’ (EC, 2003). Seeking to remain compliant rather than face the often severe economic penalties of non-compliance, the SFP inspection system appeared to have become all-encompassing in the lives of many farmers, and had affected the attitude of farmers towards the state, and particularly its agricultural department, with ramifications for disease control.

Farmers therefore had mixed views on the benefits of the subsidy payments. For some, these were a lifeline which ensured they could remain in business. One farmer even suggested that the subsidies were so important they were N. Ireland agriculture’s net profit each year. There was a sense of dependency on subsidies as an essential economic support to ensure farm viability. This view is supported by an Irish study by Howley et al. (2012) which found that subsidies were supporting otherwise unprofitable farming enterprises, particularly in the cattle rearing sector, and direct subsidy payments could account for more than 100% of total farm income. Subsidies were also seen as a benefit not just to farmers themselves, but to society in

general through lower food prices for the consumer. Several said that they would prefer to farm without ‘hand-outs’, but that they would need to receive better prices for their produce. They felt that consumers would have to accept an increase in retail prices before such a scenario could realistically be introduced. For others, subsidies were justified by the need for European cattle farming to be able to compete with NZ and other intensive cattle-producing countries outside of the EU where production costs were lower, and beef and milk could be more competitively priced in global markets.

Beef farmers were much more dependent on subsidies than their dairy counterparts. A few dairy farmers admitted that they could farm profitably without subsidies, and although the subsidies were a welcome addition to their farm returns, they had built their own particular farming model outside of a subsidy-dependent framework, with the expectation that subsidies would be phased out over the longer term. Asked what he thought of farm subsidies being abolished in the UK, as they had been in NZ, one dairy farmer said:

‘That would be great if the rest of Europe did [it]. We can't do that while we are tied up to the rest of Europe. I would quite happily ... I would far rather see it, because nobody would have any gun to my head anymore. I would rather [*laughs*] be farming with no subsidy, and nobody hanging on me, but at the end of the day it would only work if it was Europe-wide.’ (Int A28, dairy farmer)

As far as farmers were concerned, the downside to receiving subsidy payments was the system of regulatory control which had been built by the EU and the state to ensure financial probity, compliance with the rules, and the prevention of fraud. Farmers universally spoke of ‘paperwork’, ‘red tape’, ‘bureaucracy’ and ‘control’, and they labelled the system as ‘crazy’, ‘obscene’ and ‘a gun to the head’. Some younger farmers, who had known nothing else in their farming careers, were pragmatic and accepted the system as the price that had to be paid to ensure that EU monies were fairly distributed and that standards had to be maintained to ensure food safety. But for the majority there was resentment and a climate of fear of financial penalty

for infringing the rules, which could mean thousands of pounds being deducted from the SFP payment. Similar fears have been echoed by farmers across Europe (Aistara, 2009; Juntti, 2012) under the weight of the 'regulatory state' (Walby, 1999) or EU 'suprastate' (Jokinen, 2002), operating at varying scales and spheres of governance.

4.4 'Paperwork' and 'red tape' - figures for regulation

Supporting the EU and state governance regimes are the statutory obligations on farmers to document their farming in words and numbers. 'Paperwork' was therefore a key feature of everyday life in modern cattle farming. Keeping records of calf births and deaths; notifying movements of animals; recording medicines and fertiliser use; filling in subsidy claim forms: farming life was built on a foundation of paper records or their electronic equivalent. To young farmers this was just part of life; a daily chore which had to be done along with paying bills and filing receipts for the tax return. But to the older generation, this paper-work was an unwelcome burden which was viewed as holding them back from field-work, or 'real' farming. To those who left school at the earliest opportunity to farm the land and raise livestock, this was a distraction, an irritation, a bind, and to some: 'absolutely atrocious' (Int A13, dairy farmer). Paperwork was seen to be adding to the pressure of an already stressful and busy life, and contrary to all that they enjoyed doing in their working lives:

Author: 'So you find the paperwork creates a lot of pressure for you?'

Farmer: 'Yes, because ... the likes of myself left school when I was fifteen, and wasn't interested that much in education. So I wasn't educated for paperwork, and as I have got through life I suppose I have sort of half-educated myself, but I'm not that type of person. I left school to farm - I didn't leave school to sit in an office. That's what they're trying to make us do these days - are making us do indeed.' (Int A29, dairy farmer)

Paperwork was necessary to satisfy inspectors, and there was a criticism that satisfactory paperwork had become a substitute for reality in the field: if it looked right on paper it mattered less what the animals or the land looked like, they suggested. For some, paperwork was beyond

their ability to understand, and they employed someone to keep on top of it; indeed, a mini-industry had grown up around filling in subsidy claims forms. These professional ‘form-fillers’ were seen to be the best way to avoid penalties for clerical mistakes on the form and the avoidance of heavy fines. Some felt frustrated that when the state made mistakes, these were remedied ‘with the push of a button’, but farmers who made mistakes in paperwork were criminals who were penalised with stiff fines and their integrity was questioned:

‘... Now they say that you are guilty until proven innocent ... but you know, again, that's regulations. I think Europe has a lot maybe to answer [for] on that front ...’ (Int A3, dairy farmer)

‘You can never fix a mistake you make, but they [state agriculture department] can fix any mistake they make with the push of a button. They don't believe your mistakes.’ (Int A37, dairy farmer)

Hall and Pretty (2008) found that the sense of grievance and injustice around such administrative interactions with the state led to a breakdown in trust and disavowal of shared goals in sustainable land management. Farmer resistance is therefore one potential result of perceived ‘regulatory unreasonableness’ (Bardach and Kagan, 1982). The same sense of grievance came through strongly in the above-cited interviews, and many others besides.

Farmers were united in their opinion that there was too much ‘red tape’ and ‘bureaucracy’ in modern livestock farming, and they called for the regulatory burden to be reduced. They felt that ‘common sense’ had been ignored, and that the rules were inflexible and overly reductionist. A commonly cited example was the ban on spreading animal manure (slurry) on land between mid-October and the end of January (the ‘closed’ period) to comply with nitrates regulations and avoid environmental pollution through nutrient run-off into water sources. The farmers mocked such regulatory science, and suggested that farming to the calendar was potentially worse for the environment. The ‘closed’ period could often have more suitable

weather conditions than the ‘open’ period, and they felt that using their own judgement and experience would produce better results both for them and for the environment. As with van der Ploeg’s (2008: 214) discussion of the constructed ‘global cow’ with its standardised nitrogen outputs, creating harmonised rules for enforcement across the EU is not a straightforward task for the policy maker, and invokes strongly negative reactions from farmers.

In addition to anger and frustration, there was cynicism from some who believed that processors, retailers and consumers would buy their product no matter what rules and standards had been adhered to in its production, and that above all else, price was the determining factor. There is some justification for this viewpoint in the literature (e.g. Harvey and Hubbard, 2013). Rule-keeping was therefore seen as a waste of their time, but they felt forced into meeting subsidy and retailer requirements, creating an unwelcome pressure to conform, and for some this removed the joy from farming.

Alongside rules and ‘red tape’ farmers felt that they lived under a constant shadow: the fear of failing an inspection. In addition to the random inspections carried out for animal welfare, disease control, cattle identification, and land claims checks under the SFP regime, there were also inspections for Quality Assurance schemes and various retail supermarket schemes; nitrates inspections by the N. Ireland Environment Agency; and health and safety inspections. This fear of inspections meant that they lived in a state of nervous expectation:

‘You know it is always over your shoulder - it's what day you're going to have a tap on the shoulder to have another one of these.’ (Int A7, beef farmer)

‘I dread a brown paper envelope every day the post comes, waiting for the next cross-compliance check.’ (A58, dairy farmer)

Comparing the subsidy system to being ‘policed like a Communist state’ (Int A44, dairy farmer), farmers spoke of oppression and being under heavy discipline. This was taken very

personally, and although they spoke of how they tried to smooth the inspection process by being friendly and accommodating to the inspectors, they felt that the inspectors often over-emphasized minor infringements such as cobwebs on the ceiling or cracks in concrete floors. Inspectors were seen to be ‘unrealistic’ and ‘too fussy’ and farmers expected a degree of latitude and flexibility in the interpretation of the rules:

‘We know standards have to be made and adhered to, but within reason - I think there needs to be a wee bit of flexibility within the inspectors ... I think there should be a wee bit of leeway, for we are all doing our best, and there's plenty of other//’

Author: ‘A bit of give and take?’

‘There should be, yes. I think we have all battled with the weather, and we're doing our best ... Unless there's an obvious problem, I don't think we should be too persecuted, because I don't think ... well actually I'm not in a position to say entirely ... but I don't think some of the other European countries are as tight as we are here.’ (Int A3, dairy farmer)

‘Good’ inspections were ones where the inspector showed ‘understanding’ and ‘common sense’ – these were the ‘field-level bureaucrats’ (Lowe and Ward, 1997) that farmers could get on with. One farmer felt strongly that farmers had been dehumanised as a direct result of the inspection regime, and had been reduced to ‘statistics’ by the senior state officials they used to know on a personal level when they were ‘on the ground’:

‘The sad thing is that those are good people that were good people on the ground, and when they go to [headquarters] they get brainwashed - that is right, they get brainwashed by the men [sic] above them, and they lose touch. We all become ... instead of people, we are statistics ... They are living in there, shielded from reality.’ (Int A53, beef farmer)

Inspection discrepancies provoked in farmers a sense of betrayal by the inspector, but the blame was mostly attached to the higher authorities who they believed depersonalised the inspector’s report and issued the penalty:

‘Well, they go away and tell you that it's alright, but that's only because they pass it on - as soon as it goes upstairs it sort of loses the personal ... I mean you can sit here with a guy who has come out and inspected your cows ... it wasn't going to be a problem – “No bother, that was great [*with sarcasm*] - that was a really good result.” He goes away, it comes back, and then suddenly that was a discrepancy that was reported to [the state agricultural office] or wherever, and your Single Farm Payment is delayed and you're fined.’ (Int A28, dairy farmer)

The farmers also found this network of control and governance very frustrating, and there was an acute sense of a loss of personal agency. They thought they were no longer able to dictate the terms of management on their own farm, and felt hedged in by a pressure to conform to the desires of the state or even to non-farming rural neighbours with a different discourse on agriculture's benefits to society:

‘We try to accommodate them [the neighbours] so we are not a total nuisance, but we are still a nuisance, like every other farmer. If you meet cars on the road, if you look behind you the initial reaction is “Not them again.” You can read their lips.’ (Int A37, dairy farmer)

Author: ‘What about being your own boss?’

Farmer: ‘Yes, well you are answerable to ... well, no //’

Author: ‘To your brother, your partners? //’

Farmer: ‘Well, no, I was going to say you are answerable to nobody, but you're not, because we've got the Agricultural Police Service of Northern Ireland - the Department [of Agriculture] - on top of us all the time, so that's the worst thing about farming.’ (Int A28, dairy farmer)

‘I don't like how the [Department] views the farmer - they are very intransigent about the whole thing. But if you can actually prove, quickly, that it was a clerical error on the other side, on the [Department] side, 'Click', and it's sorted. That just isn't conducive with [good] relationships - relationships that are important - because if you are talking

about trying to eradicate disease, you know everybody has a part to play, and it should be a team effort.’ (Int A23, dairy farmer)

From politicians in the N. Ireland Assembly and Westminster to the bureaucracies of Brussels, state agriculture officials, supermarket retailers, food processors and even in the wider general public, many farmers felt they had few friends and defenders; no one to stick up for them. The world seemed a rather lonely place for many down on the farm.

4.5 Farming stress

With a combination of relentless bad weather over the summer grazing season, and difficulties in gathering harvests and keeping land from being damaged in wet conditions, there was a sense of gloom and foreboding amongst many of my interviewees about the short-to-medium term future for their farm in late 2012. This was to worsen after the Winter and Spring of 2012-13, when the cold and incessantly wet weather coupled with heavy snowfalls prevented the turnout of cattle to pasture, and provoked a severe fodder crisis. For some farmers, varying combinations of weather conditions, financial troubles, family breakdown, regulatory pressures and bTB-related herd restrictions produced a point of no return, and vets spoke of suicides amongst farmers that they knew. One reported how a local priest had counselled six farmers in one week who were thought to be contemplating suicide. Nine months later, the feed crisis in the Spring of 2013 created similar pressures on farmers, as a Farmers’ Union official explained:

‘There are obviously other factors [apart from bTB] which contribute to those kinds of cases but unfortunately whenever the industry is the way that it is at the moment, all factors point towards not being able to sustain [the farm] and go on ... I mean a farmer who can't feed his cattle can't cope with that - they just can't cope. We are seriously worried. You read about cases [of suicide] in the paper, and it's all too close to home.’
(Int A54, Farmers’ Union official)

One private vet saw it as a very important part of his professional role to act as a listening ear for farmers in such situations:

‘As a vet I see my role, especially as a rural vet who has been in one place for a long time, you do have a social role - you are part of the social fabric of the rural community ... We don't visit as often, but at least we are there. And I know clients where I am the only person they have spoken to for the week - there is nobody else there.’ (Int A48, private vet)

bTB certainly contributed to the sense of despair. State veterinary officials spoke of coping with farmers breaking down in tears, pleading for an escape route from bTB restrictions which had prevented cattle sales, reduced their cash flow, and crippled their business. There was often a strong sense of helplessness in the countryside. Farmers were being referred to rural helplines for counselling and support; vets struggled to know how to respond. bTB breakdowns and the eradication programme, particularly the perceived inaction by the state on the culling of badgers, were viewed as part of this complex and stressful mix:

Vet 2 – ‘I think farmers feel they are very much on their own and nobody is really on their side - nobody is doing anything for them, and as you say, if something happened - even if it is only small - we are seen to be doing something [about bTB], then the farmers would probably work more//’

Vet 4 – ‘They would buy into it a wee bit better.’

Vet 2 – ‘They would probably contribute //’

Vet 3 – ‘Rather than just being imposed on them //’

Vet 1 – ‘A bit of a carrot.’ (Int A43, state vets, focus group)

For other herd keepers unaffected by bTB (at any one time approximately 93% of herds are officially tuberculosis-free), and vets used to testing as a daily occupation, the disease and its control were almost incidental. The annual bTB herd test was just a date on the calendar and could be part of the everyday rhythm of agricultural life:

‘It's hard to say that it's apathy, because it has become a day in the diary, just another day for everybody that you have to do, a job you have to do, like you have to sow the fertiliser - you have to do this ... it's just another one of these days and the vet says ‘It's

TB testing time again” ... and they just go out and fall asleep and just go through the motions.’ (Int A19, private vet)

Author: ‘What do you think you can do to keep TB out of your herd? I mean, at the moment you don't have the disease and you haven't had it for a long time, so are you doing something right, or do you never think about it?’

Farmer: ‘No, you never really think about it. Just this area in general is pretty clear of it ... nearer [local town] bits and pieces seem to crop up, but around this area we are pretty clear’. (Int A3, dairy farmer)

‘We are due in December to be tested again for TB ... We have never been ... now, have we never been? ... Yes, we have been closed down because of TB - we have had animals taken, but it was a long time ago. My father was of the opinion that it was possibly a false positive, but I couldn't swear to that ... We occasionally get letters through the post that 'Mr So-and-So' on one side of us, or 'Mr So-and-So' on the other, is closed down. You don't pay too much heed, and then you get a letter that Mr So-and-So has been opened.’ (Int A20, dairy farmer)

For others whose herds were severely affected, especially for shorter periods of time where adaptations to the business structure could not be made, the disease and its effects, combined with other dynamics, became cumulative and all-consuming:

‘It [bTB] has tied us up so much - to go from maybe 360 or 370 cattle on the farm to maybe 530-540 today, with bad milk price, bad weather, input costs rising unbelievably, and the bank's not easy talked to we have found. It's as tough a year as I remember, and I'm sure it's as tough as Dad remembers. We would say it's our worst year.’ (Int A24, dairy farmer)

The connection between severe farming stress and bTB was often only when the disease came knocking on the door and only *after-the-event*. As we have already considered, there was certainly much else to drive farmers towards despair.

5. Conclusion

This paper has demonstrated how bTB fits into a complex socioeconomic landscape of everyday farming life in N. Ireland in the 21st century, and posits that the disease and factors affecting its control must not be viewed in isolation of the wider context within which they are situated. Cattle farmers in N. Ireland are living with the social costs of a climate of uncertainty and almost constant pressure. Spectres of global market forces, regulations, inspections, paperwork, bad weather, stress and disease hang over and shape their attitudes and actions. bTB is but one potential stress factor amongst multiple others, and as such, attention to bTB, and particularly efforts to prevent bTB incursion through better biosecurity, often becomes relegated on the list of everyday priorities – other threats may be much more imminent and real. This may help to explain why Naylor and Courtney (2014) found that although farmers in England believed bTB to be a problem, few took action to avoid further outbreaks. The competitive business environment in which cattle farming operates, with global markets creating pressure on fulltime farmers to increase production efficiency and maximize output is not conducive to statutory endemic disease control, when other priorities can appear to be more pressing.

We have considered the narrative that farmers' attitudes and behaviours are partly responsible for the ongoing spread of, and failure to eliminate, bTB in N. Ireland: what are we to conclude? If, as reported here, not enough effort is being made to heed state veterinary advice to reduce the risk of bTB incursion into the herd, then farmers may be held partly accountable and partly to blame for the failure to eliminate bTB. But substituting 'bTB' for water contamination in Lowe et al.'s (1997:119) case study on pollution, farmers may have 'other preoccupations'. Their main focus as farmers is the production of milk and beef, and controlling disease is an important part of these objectives; but bTB does not always come top of their list of priorities as many struggle to keep their businesses afloat. If farmers are to be blamed by the state for not paying due deference to bTB prevention and control on their farms, the often incredibly

difficult material and economic conditions under which they farm may offer partial explanation: a complex amalgam of factors has the potential to cause disengagement and disillusionment amongst family farming stakeholders.

What has not been elucidated in the bTB literature to date is the importance of the unintended spill-over consequences of the statutory regulation of farming, as demonstrated by the interview data presented in this paper. Enticott (2008a, 2008b) suggests the breakdown in trust relationships between farmers and the state authorities in Britain is caused primarily by very different farmer attitudes to scientific research and the practicality of state recommendations on bTB biosecurity, especially concerning badgers, but also hints at strained relationships due to past handling of the foot-and-mouth disease crisis in 2001, and difficulties surrounding the creation of the Rural Payments Agency. However, this research in N. Ireland suggests that the spectre of regulatory scrutiny dominates the farming landscape, reshaping farmers' attitudes and increasing their alienation from the state in its role as enforcer of EU and national legislation. As a result, many farmers are more reluctant to engage with the state because of perceived injustices and loss of autonomy, which seriously affects relationships and state aspirations for a partnership approach to disease control, especially for a chronic and endemic disease such as bTB. A contextualized political ecology of bTB reveals that state officials need to work to mend these broken governance relationships if this troublesome disease is to be better controlled and advancements made towards elimination in the future, but the state is in a conflicted and unenviable position as policy maker, regulator and enforcer, as well as advisor, facilitator and enabler.

Although statutory animal disease control may appear to be primarily about animals, it is therefore much more about relationships between *people* than is generally acknowledged outside of the social science community (Enticott, 2008a; Enticott et al., 2012; Fisher, 2013; Garforth, 2015; Palmer et al., 2009). There is a need for the state to re-engage with the farmers

as people, not statistics, to rebuild trust, broaden vision, and promote reconciliation and partnership. Conversely, farmers need to re-engage with state officials as people of good will and purpose, not viewing the state as an ephemeral entity exercising disease control authority with apparently malicious intent. Broken and strained relationships need to be repaired, and marginalization avoided. State regulation and its corollary - resistance to statutory authority - have produced division between opposing sides and a conflict situation. Many farmers are not fully enrolled in the effort to eliminate the disease, and many are reluctant to take ownership of the problem. Efforts to encourage farmers to adopt better farm biosecurity against bTB have often failed, perhaps due to the estrangement from the *messenger* as much as the message. Leach *et al.* (2010) described this effect in relation to Ebola and also the response to highly-pathogenic avian influenza (HPAI), with governance interventions being derailed by perceived injustice on the ground.

Rather like the ‘public deficit model’, whereby the task of policy makers and scientists is to educate and thereby persuade a public lacking in the knowledge necessary to accept and enact, there is a commonly held view that farmers merely need to be better educated and more informed about biosecurity to reduce the implementation gap. This is not necessarily the case – more knowledge does not guarantee implementation. Alternatively, better engagement opens the door to co-production of solutions to bTB, taking due cognisance of the ingenuity and adaptability of lay expertise of farmers, and professional expertise of vets, in problem-solving at ground level. This involves co-opting local knowledge – defined by Fish *et al.* (2011:2032) as ‘bodies of expertise tied to the experience of disease in particular places and locales’ – and it includes both farmers and their veterinary practitioners. Co-produced disease control strategies ‘are likely to result in stronger trust between actors, required levels of compliance, and ultimately, better impact on human and animal welfare’ (Catley *et al.*, 2012: 158). As political ecologist Mara Goldman (2007: 313) argues, the focus can be shifted to ‘building

dialogues across knowledge spaces and between different knowledge participants’, drawing together lay and expert knowledges in places of mutual respect. Adopting lay expertise does not envisage or expect the public to provide ‘competence to deal directly with specialist technical questions’ (Wynne, 2007: 107), but it does mean dealing with and influencing the *social* aspects of the problem, usually ignored or suppressed in normative stakeholder encounters.

This not only involves engaging with farming representative bodies such as the Farmers’ Union, but also, and perhaps more importantly, directly engaging with farmers individually as well as collectively. There is a need to listen ‘to voices that do *not* contribute to formal policy-making ... to take into account the decisions and actions being made by others on the ground *outside* the formal policy process [*emphasis in original*]’ (Blaikie, 2009: 5). In doing so, the state must consider the difficult economic conditions within which farmers are operating. In turn, farmers must be willing to trust the good will of the state in its efforts to eliminate bTB for both their individual benefit and the future safeguarding of their industry within the confines of their statutory obligations, and desiring to protect animal and animal product exports in a globalised marketplace.

Approaching bTB from a political ecology perspective once again proves its worth in emphasizing the ‘political economic roots of environmental problems’ in a way which ‘strives to not only interpret the world as it is, but which continues to work actively to change it’ (McCarthy et al., 2015: 626, 628). This examination of bTB in N. Ireland demonstrates that First World agriculture and animal health are subjects ripe for further investigation within this framework; the links in the ‘chains of explanation’ can be joined to provide interpretations as a forerunner to finding possible solutions to the challenging politics and ecologies of this problem (Robinson 2015, 2017). Further research in other Member States of the EU should investigate whether the findings of this place-based research are applicable elsewhere, and not

just for bTB control. The implications of the UK's referendum decision in June 2016 to leave the EU are not yet fully known, but it will be interesting to discover what this means for the relationship between farmers and the state in N. Ireland as a new governance regime comes into being, with exposure to alternative indeterminate global market forces affecting everyday life on the farm, for ill or for good, inside or beyond the confines of a European single market and regulatory framework.

Acknowledgements

Funding for this PhD research was provided by the Department of Agriculture, Environment and Rural Affairs (DAERA) in N. Ireland. Additional funding for fieldwork was provided by the Dudley Stamp Memorial Fund, UK. Ethical approval was provided by the Department of Geography at Durham University. The research was supervised by Prof. Peter Atkins, Prof. Gavin Bridge and Dr Divya Tolia-Kelly at Durham University, whose help and guidance I very gratefully acknowledge. I also sincerely thank the research participants who gave their consent to be interviewed for their views and experiences of bTB in N. Ireland, and the editor and reviewers for their very helpful comments.

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