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‘Hell or high water’: Good farming and environmental care as contested practices in the implementation of Nitrate Vulnerable Zones in Wales

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Abstract

This paper explores how dairy farmers attempt to navigate prescribed principles and fixed practices of environmental care in the context of Nitrate Vulnerable Zones (NVZ) and the EU Water Framework Directive. In contrast to agri-environmental schemes, farm-level compliance with NVZ regulations often involves substantial investment costs for the farmer. Drawing on a case study of Wales, we consider why controversial practices of nitrate management exist on farms and how, through a combined narrative of vulnerability and care, certain practices are legitimised. Such narratives seemingly involve an attempt to redefine ‘good farmer’ identities within conventional agriculture, whereby the act and declared commitment to administering ‘good care’ becomes separated from a responsibility for the outcomes of some farming practices. In exploring why such a limited framing of the good farmer and good care are being pursued, we look at the role of environmental regulation (specifically NVZ regulation) in shaping this response. We conclude that a distancing of responsibility for the outcomes of poor care does not, necessarily, equate with an actual absence of caring about, or a failure to care for the local environment. Moreover, rather than symbolising a logic of being resistant to change, for many farmers it represents a perceived inability to change. Such is the growing disconnect between conventional systems of farming practice and the environmental state of many traditional family farms that, rather than being at ‘cross-roads’, these farmers have instead seemingly reached a ‘dead end’. Our analysis is supported by three data sets (compiled between 2016 and 2018): responses to a questionnaire sent to 1,000 farmers in Wales; semi-structured interviews with industry stakeholders (combined with farm site visits in the case of farmer respondents); and, analysis of responses (n=258) to a Welsh Government-led national public consultation on the proposed expansion of the regulation of NVZs in Wales.

Introduction

The intensification of UK agriculture in recent decades has led to negative environmental impact on water bodies. The effects include the release of pesticides and biological contaminants (e.g. microbiological organisms in manure, as well as nutrients resulting from fertilizer and slurry application) due to poor soil management techniques. Indeed, 60% of nitrates in water bodies are estimated to have agricultural origins (Holden et al 2015). Elevated levels of nitrate in drinking water

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have long been associated with increased human health risk, environmental damage and considerable economic cost (Hayman & Alston 1999; Ward et al., 2005; Barnes et al. 2013).\(^2\) To mitigate these problems the European Union (EU) established the Nitrates Directive in 1991 (91/676/EEC), and subsequently, in 2000, the Water Framework Directive (2000/60/EC). The Nitrates Directive is endorsed by the European Commission as ‘a key legislative instrument for ensuring the protection of waters against agricultural pressures’.\(^3\) However, the implementation of the Directive attracts considerable controversy (Ortolano et al. 2009). In part this is because the involvement of farmers located within designated zones is compulsory, despite there being little or no compensation to offset resulting expense. Many of the costs incurred result from the need for adherence to ‘closed periods’ (when manure cannot be spread to land), with the associated restrictions on practice requiring investment in storage facilities or reduction of livestock numbers. However, evidence suggests that the action programmes developed by member states as part of their response to the Nitrates Directive are unlikely to considerably reduce nitrate concentrations and therefore will be of limited environmental benefit (Cook, 1991; Worrall et al. 2009).

In this paper, we use a case study of Wales to look at how farmers have responded to the imposition of Nitrate Vulnerable Zones (NVZs). In doing so, we seek to understand the potential effect of environmental legislation on day-to-day farming practice, and as integral to this, the ways in which farmers administer, account for and take responsibility for on-farm practices of environmental care. The discussion is based on empirical data collected in immediate follow on from the most recent statutory four-year review (2016) of its administration in this country. The resulting proposal by Welsh Government (WG), that the area of land subjected to compulsory agricultural practice restrictions in Wales be increased from 2.4% to either 8% (targeted) or 100% (blanket) of Wales, ignited considerable contestation amongst key stakeholders. From within the farming industry this was especially true of dairy farmers and their sector representatives.

Arguably, in the context of nitrate pollution, dairy farming has a greater environmental impact on water courses than any other farming sector. Accordingly, whilst the empirical research collected in support of this paper forms part of a study which encompassed a range of different farming types, in the discussion that follows we are primarily concerned with the practices and narratives of dairy farmers. Wales covers an area of just over 2,000,000 hectares, of which 1,903,000 ha is designated as agricultural. In 2018 there were 1,549 farms involved in dairy farming, covering an area of 185,000 ha with a total annual output of £839 million (Welsh Government, 2019). As the output from all farms in Wales amounts to nearly 1.9 billion the dairy sector clearly constitutes an important component with milk and milk products comprising 34% of production as a share of gross output (Welsh Government, 2019).

As, post EU-exit, England, Northern Ireland, Wales and Scotland each begin to launch new agricultural, environmental and stewardship policies, it is now more crucial than ever to learn from the impact of previous legislation and practice. Towards this aim we ask, firstly: how are fixed practices of environmental care, as prescribed through regulation, encountered and navigated by (dairy) farmers

\(^2\) It can cause eutrophication of water bodies (Pretty, Mason, Nedwell, Hine, & Leaf, 2003). In addition, its removal from water is costly; between 2004 and 2009, for example, water companies in England spent some £189 million on nitrate removal (NAO, 2010).

in their everyday practice - and to what effect? And, secondly: where deviances occur from prescribed environmental care practices, how do (dairy) farmers attempt to narrate and rationalise these without undermining a good farmer identity?

The paper is structured as follows: drawing on existing literature we next introduce our analytical frame which brings together scholarship on the ‘good farmer’ and on practices of care. We then outline our research methodology. This is followed by a brief technical overview of how the Nitrates Directive is administered in Wales as well as its key characteristics. We then present the findings, firstly considering stakeholder narratives of why on-farm compliance with the Directive risks being detrimental to ‘good’ practices of environmental care; and secondly, analysing the extent to which the Directive has influenced farmer attitudes towards on-farm environmental management within NVZs. Our findings also have wider relevance to the recent growth in interest in soil care within the social sciences. Within this field the study of attitudes towards and practices of slurry management has received little academic attention.

**Good farmers and the practicing of environmental care**

A long-established hegemonic discourse depicts the British farming industry as following a productivist rationale which is essential for food security, but also, as an industry which remains at risk of harming the environment due to internal weaknesses and failings. Farmers are regularly profiled as needing to become better at combining production and stewardship. As a result, both regulatory and voluntary interventions have been developed to bring about the ‘required’ conduct. Voluntary approaches used to influence positive behavioural change include agri-environment schemes, such as the countryside stewardship scheme (Cary and Wilkinson, 1997; Carboni and Napier, 1993; Wilson and Hart, 2000). There has been much debate on the efficacy of such schemes with regard to their adoption and resulting change in farmers’ beliefs, attitudes and behaviours (Barnes et al, 2013). However, only a small number of studies have examined farmer response to compulsory regulation. Those that have in the context of nitrates and water quality management find high levels of resistance to such regulation as well indications of an aversion to responsibility (Barnes et al 2013; Popp and Rodriguez, 2007; Hu and Morton, 2011; Ortolano et al 2009). However, with the exception of Ortolano et al (2009), the tendency of such studies to rely on structured surveys limits understanding about how expressions of resistance to regulation and aversion to responsibility go on to shape care practice at the farm level.

An even smaller number of studies have focused on the impact of compulsory regulation on dairy farmers. This, despite their concentration of livestock production facilities raising particular challenges of their own (Lemaire et al 2014; Ortolano et al 2009). In their study of Australian farming systems, for example, Drewery et al (2006) found that nitrogen losses from dairy farming can be much greater than those from other forms of pastoral agriculture and highlighted the need to target particular farmer cohorts with tailored policy measures (see also Buckley et al 2015). The impact of compulsory environmental regulation is seemingly especially acute for conventional dairy farmers, many of whom

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4 Whilst Ortolano et al’s (2009) otherwise well-crafted study of Nitrate programmes in Brittany was based on (21) semi-structured interviews, it included only five farmer interviews, thereby limiting the scope for generalisability (as also acknowledged by the authors themselves).
struggle to navigate the tensions between production and compliance without in the process undermining their ability to perform the role of ‘good farmer’.

The concept of the ‘good farmer’ has received considerable attention within rural scholarship over the course of the last two decades (see, e.g. Burton, 2004; Burton et al. 2008; Butler and Holloway, 2016; Naylor et al., 2016; Sutherland and Darnhofer, 2012; Sutherland 2013). The theoretical foundation for exploring the social construction of a good farmer, and with it, the importance afforded by farmers for ‘upholding good farming ideals’ (Riley, 2016), is the work of Bourdieu. Bourdieu’s conceptualisation of habitus, capital, and field, supports analysis of the ways in which farming practice, attitudes and disposition emerge, are sustained and upon occasion come to change at both an individual and collective level. In essence, attending to the recognition, valuing and deployment of varying forms of capital – including economic, social and cultural capital – by farmers, but also other dominant stakeholders operating within the same field of action, helps us to explain the nature of farming practice. In the case of many conventional agriculturalists especially, this results in a depiction of ‘good farming’ as being dominated by a mind-set of productivism.

Previously, the good farmer concept has been used to explain a resistance to change by some farmers (Burton, 2004; Burton et al., 2008). Such resistance was said to occur “on the basis of an anticipated loss of identity or social/ cultural rewards” (Burton, 2004:196). This included a resistance to the incorporation of changes in practice perceived as constituting a shift away from a productivist farm identity. During the last decade, however, the good farmer concept has been further developed through incorporation of a more emergent and place-sensitive understanding of how the ideals of being a good farmer are practiced (Riley, 2016). This approach has resulted in a growing number of studies exploring how good farming comes to be (re)configured over time (see, e.g. Sutherland and Darnhofer, 2012; Shortall et al., 2018), over space (Haggerty et al., 2009) and in relation to differing agricultural sectors (De Krom, 2015; Sutherland, 2013).

In expanding further this emergent and place-sensitive line of scholarship, here we explore how some dairy farmers attempt to navigate and contest the impact of conflicting good farmer narratives with respect to practices of environmental care; in particular, this includes where they have become codified within government regulation. By looking more closely at what farmers are doing on-the-ground when confronted with regulation of everyday practices such as slurry management, this in turn tells us more about the relationship between productivism and environmental care at a farm level.

For Bourdieu (1984) capital does not hold intrinsic value, but rather it is gained in a particular field. Moreover, it is the field that determines both what constitutes capital in that arena, and “who is able to successfully activate that capital” (Lareau et al., 2016: 294). Attention to the field in turn requires that we look not only at the actions of individuals, but also the ‘rules of the game’. Integral here, is a sensitivity for the subtle ways in which individuals learn the rules of the game and learn to respond to any subsequent changes to them (Lareau et al., 2016). Both conventional and organic farming systems are full of rules of the game, both literal and figurative; many of these rules are imposed from top down, with NVZ compliance being a case in point. By learning the rules of the game – including, in the case of formal rules, as well as the extent and regularity to which they are enforced - individuals are in turn able to prioritise and value certain actions and performances over others.
How such variations in what comes to be prioritized at the farm level play out in practice have been considered elsewhere. Shortall et al. (2017), for example, identify two conflicting approaches in the context of biosecurity practice: “the large commercial farmer who has the economic capital to invest in biosecurity and veterinary services; and the self-sufficient stock-keeper whose cultural and social capital lead them to manage herd health independently” (Shortall et al., 2017: 583). The range of practices and opinions reported by the farmers in Shorthall et al’s study with regards to biosecurity, and animal health more broadly, reflect the fact that not only do differing standards of care exist within, as well as across, different farming systems, but also differing viewpoints of what constitutes good care (see also Singleton, 2010). Furthermore, what is deemed to constitute the right sort of care in a farm setting will vary across actors, as well also as over time and space (Law, 2010). The work of Joan Tronto on care becomes complimentary to the good farmer concept in this respect; notably, its incorporation here supports an extended focus on how practices and perceptions of good care underpin narratives of good farming.

In defining the key components of ‘good’ care, Tronto (1993; 2013) argues for it first and foremost to be thought of as a practice (see also Mol, 2008; Mol et al., 2010). From this starting point Tronto (1993) proceeds to set out ‘four phases of caring’, and integral to these phases, ‘four elements of care’. The four phases comprise: caring about – ‘noting the existence of a need and making an assessment that this need should be met’ (p106); taking care of – ‘assuming some responsibility for the identified need and determining how to respond’ (p106); care giving; and, care receiving – an acknowledgement that ‘the object of care will be affected by the care it receives’ (p107). The four elements of care underpinning these four phases are: attentiveness, responsibility, competence on the part of the care giver and, the responsiveness ‘of the care receiver to the care’ (Tronto, 1993:134). In her later work Tronto (2013) subsequently adds a fifth phase of ‘caring with’, with this being founded upon ‘reciprocity’. The latter two phases of ‘care receiving’ and ‘caring with’ give emphasis to the fact that the practicing of care is fundamentally a relational activity (Moriggi et al., 2020a).

Notably, in setting out the various phases and elements of care, Tronto (1993) distinguishes between obligation-based and responsibility-based care ethics. As Edwards (2009:234) subsequently summarises, “in obligation-based approaches, responding to others involves a ‘two-stage’ process, a first in which one is made aware of the plight of another person, and a second in which one deliberates over which obligations one has towards them – if any”. In contrast, “in responsibility-based ethics there is claimed to be a pre-existing moral relationship between people, and so responding to their plight is ‘automatic’ not in need of justification” (p234); as such it is motivated not by any legal obligations or other formal ‘rules of the game’ (Moriggi et al., 2020b). We consider this distinction further in our analysis of farming practice in the NVZs of Wales.

Informed by both the ‘good farmer’ and ‘practices of care’ conceptual frames, we thus proceed by comparing farmer and regulatory conceptions of good environmental care practices, and the potential tensions or contradictions which this can create when it comes to administering and taking responsibility for particular forms of on-farm resource management. In doing so we give particular consideration in our case study to the meaning of slurry to a farmer and how this in turn serves to shape on-farm practices of slurry management (Burton, 2004:212). By reviewing the impact of the Nitrate Pollution Prevention (Wales) Regulations (2013) at a farm level, we are able to analyse the
occasions whereby good environmental care practice, as codified in environmental regulation, is interpreted by farmers as either reinforcing or undermining their ‘good farmer’ status.

**Method**

The empirical research supporting this paper was undertaken in Wales in 2016-2018. Commencing at the time of a national review of the implementation of the Nitrates Directive, it also subsequently ran alongside a public consultation on the outcomes of the review and the referendum concerning the withdrawal of the UK from the EU. The scope of the data collection was designed with the aim of capturing the perspective and attitudes of farmers currently in an NVZ, as well as those whose farms might become designated in the near future. The purpose was to assess farmer opinion on the codes of good agricultural practice which were compulsory within NVZs, as well as the actual and/or anticipated future impact of NVZ enforcement on the environmental practice of affected farmers.

A mixed-method data collection strategy was employed to capture both the breadth and depth of the impact of NVZs in Wales. To begin with, a bilingual questionnaire (English and Welsh) was developed, and circulated to expert officials within WG for comment. The online directory ‘Yell.com’ was searched for ‘farmers’ in target counties (counties already categorised as, or implicated by the 2015 review for future categorisation to contain NVZs), resulting in a list of just over a thousand addresses. Hard copy questionnaires were sent to these addresses. In parallel, farmers throughout Wales were encouraged to participate (via an online version of the survey), with promotion through emails and twitter feeds sent via the NFU and popular media publication ‘Farmers Weekly’. The questionnaire remained live for four weeks, ending on the 31st July 2016. Ninety-eight postal surveys were returned (all stemming from the original mail out), including seven in Welsh.

The survey posed a series of both closed and open-ended questions aimed at elucidating farmer viewpoints on the perceived benefits and constraints of farming in an NVZ - in general and with specific regard to on-farm practices of resource management. This was preceded by a short section on farm type in which respondents could tick as many identification categories as they felt applied to them. 45% categorized themselves as dairy. Survey respondents were invited to self-nominate for participation in a follow-up on-farm research interview. Thirty farmers indicated their willingness to participate, eight of which were selected.

Of those selected for interview, three were already farming in an NVZ and five were dairy farmers. Each farmer was visited on the farm and interviewed by two members of the research team; in most cases the interview was followed by a farm walk, during which photographs were taken. All interviews were conducted in English and digitally recorded for subsequent analysis. The interview questions were designed to extend and deepen the information captured via the questionnaire, and to secure data on the perceptions, knowledge and attitude of respondents towards the impact of NVZs on land stewardship and nitrate management practices at both a farm and catchment scale. Interviewees were also asked about the perceived significance of the impending EU-exit on the regulatory design of NVZs, including the current proposal that their coverage be extended to either 8% or 100% of Wales.

During the autumn of 2016, in parallel to undertaking interviews with farmers, additional key stakeholder interviews (semi-structured) were also conducted with officers from Natural Resources...
Wales (NRW), Welsh Government (WG), and with a senior staff representative from the National Farmers Union (n.=6). Subsequently, in 2018, the responses to a government-led public consultation on the future regulation of NVZs in Wales were analysed (n.=258) (the raw data file having been made available to the team by WG), and a follow-up research meeting was undertaken with two officials within Welsh Government. The purpose of this strand of data collection was to incorporate the views of a wider range of key stakeholders on the design and impact of NVZs on farming practice plus their efficacy in terms of reducing nitrate loss to surface waters; also, the potential for introducing a change of approach should the designated total land area increase and/ or following the subsequent departure from the EU.

All components of each data set was thematically analysed, both individually and collectively. They were also critically considered in relation to one another. The analysis was guided throughout by the above stated research questions and by the combined conceptual frames of ‘good care’ and the ‘good farmer’.

**Protecting water from agricultural pressures in Wales: Nitrates Directive (91/676/EEC)**

The Nitrates Directive delivers on the aim of establishing ‘codes of good agricultural practice’ - the measures which become compulsory within areas known as Nitrate Vulnerable Zones (NVZs). Specifically, the stated measures include a duty upon recognised authorities for: (1) “limiting the periods when nitrogen fertilizers can be applied on land in order to target application to periods when crops require nitrogen and prevent nutrient losses to waters”; (2) “limiting the conditions for fertilizer application (on steeply sloping ground, frozen or snow covered ground, near water courses, etc.) to prevent nitrate losses from leaching and run-off”; (3) setting a “minimum required storage capacity for livestock manure”; (4) applying “crop rotations, soil winter cover, and catch crops to prevent nitrate leaching and run-off during wet seasons”; and (5) “setting a maximum amount of livestock manure to be applied (corresponding to 170 kg nitrogen /hectare/year)” (taking into account crop needs, all nitrogen inputs and soil nitrogen supply). EU Member States agreed to review their implementation of the Nitrates Directive every four years. Farmers also must not spread any manufactured fertilisers or organic manures if a field is either ‘waterlogged, flooded or covered in snow’, or ‘frozen for more than 12 hours in the previous 24 hours’.

In Wales, the Nitrates Directive is currently administered in national law through the ‘Nitrate Pollution Prevention (Wales) Regulations 2013’. The primary function of this regulation is to designate and set legally binding rules in accordance with the above prescribed farming practices. Table 1 (below) documents the closed periods for NVZs in Wales, during which organic manure with high readily available nitrogen must not be applied. From the end of the closed period until the end of February, the maximum amount of slurry that may be spread at any one time is 30 cubic metres per hectare; there must be at least three weeks between each spreading. This closed period is a feature across

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5 All views expressed by the respondents are their personal opinion only.
Europe as voluntary measures established in the Code of Good Agricultural Practice have become mandatory in all European states where an NVZ has been designated. However, there exists considerable variation in approach between member states, with regard to designation of NVZs. For instance, cases where the whole country has been designated as an NVZ include Austria, Denmark, Finland, Germany and The Netherlands (Driver, 2016; Jakobsson et al., 2002). Defra was put under considerable pressure from the EU to designate the whole of England as an NVZ (Driver, 2016).

Table 1: Closed periods during which organic manure with high readily available nitrogen must not be applied within Wales’ NVZs.11

<table>
<thead>
<tr>
<th>Soil type</th>
<th>Grassland</th>
<th>Tillage land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandy or shallow soil</td>
<td>1 September to 31 December</td>
<td>1 August to 31 December</td>
</tr>
<tr>
<td>All other soils</td>
<td>15 October to 31 January</td>
<td>1 October to 31 January</td>
</tr>
</tbody>
</table>

The responsibility for monitoring and regulating farming practice within the NVZs of Wales falls to Natural Resource Wales (NRW).12 In 2017 the Welsh Government ran a consultation as part of its review of the designated areas and action programme to tackle nitrate pollution. The consultation ran for a twelve week period. Respondents were asked whether they preferred continuing with discrete NVZ designations (at that time, 2.4% of Wales, with the proposal that it be extended to 8%) or applying the Action Programme to a ‘Whole Wales’ NVZ designation. They were also asked if closed periods should be extended to farmyard manure and whether cover crops should be included in the Action Programme (Welsh Government, 2018). Following this review, NRW presented evidence to the WG supporting a proposed expansion of the area of land designated as NVZ to 8% of Wales. At the time of writing, Welsh Government have issued draft regulations for an All-Wales Nitrate Vulnerable Zone.

Confronting the Nitrates Directive: accounting for the challenges of NVZ ‘compliance’

Seemingly central to the controversy that NVZ regulations attract in member states across the EU is the rigid, ‘old fashioned’ dictatorial style of governing environmental practice enshrined in the Nitrates Directive. As was commented by a member of WG “the Nitrates Directive is quite old – it is quite specific ‘do this, this, this’” (WG meeting – 04-05-18). Despite this acknowledgement, however, and notably also the recent decision of the UK to exit from the EU, the intention of WG to further extend its coverage has been retained. A particular point of concern most often cited by respondents in Wales is the imposition of closed periods for slurry spreading. In practice, though, the level of concern expressed is to a large extent dependent on farm type, scale and intensity of production. Also relevant is whether or not the farm has organic status. Amongst the respondents, it was the conventional dairy farmers who found the NVZ restrictions the most challenging - especially those without the economic capital for large scale technological investment. A similar finding was reported by Macgregor and Warren (2016) in their study of Scottish farmers. Two other salient factors are the amount of slurry produced through conventional dairy farming methods and a corresponding farming model which

12 NRW is a relatively recently established public sector regulatory body (comprising of three former independent organisations: Forestry Commission Wales, Environment Agency Wales and the Countryside Council for Wales).
allows a disconnect with land-based farming, resulting in increased livestock stocking densities. That is, it encourages a disproportionate number of cattle in comparison to the size of land holding. The result is a lack of land on which to spread slurry and, accordingly, the need for further expenditure on slurry storage to meet the restrictions of closed periods. Directly relevant here is a tendency to regard slurry merely as waste. It is in this operating context that we explore further here how fixed institutional rules for environmental care come to be navigated at farm-level in Wales.

As noted above, a common and long-running trend in the management of mainstream agricultural systems is for farmers to increase their livestock numbers over time; the dairy sector is no exception. For many farmers in Wales, though, this is not matched by a parallel investment in supporting infrastructure. Indeed, slurry storage facilities were regularly reported by farmer and NRW respondents alike, as being at the maximum capacity by the end of the closed period. New slurry stores of adequate size were estimated by larger dairy operators to amount to a “six figure sum with no direct financial return” [farmer interviewee 01]. For smaller scale dairy farmers favouring low-tech methods of production, the long-running low price of milk, we were told, made it unviable to invest in capital intensive infrastructure purely in order to comply with heightened environmental regulation: “…I don’t see the need for forcing farmers down the route of vast increasing capital expenditure in most cases. Taken to its extreme it would put people out of business” [farmer interviewee 01].

In the case of those farmers who have already engaged in an on-going programme of investment in new infrastructure and technology in order to sustain an intensive model of dairy production, this can create a feeling of being locked in. Alternative options such as reducing livestock numbers, or the intensity of production (and hence, the volume of slurry needing to be stored), are themselves regarded as counter to the industry’s direction of travel: “…dairy farm numbers have reduced by 30% and individual unit sizes have grown to fund the investment in slurry storage” (WG Consultation-R247). In explaining how farmers operating within an NVZ dealt with this scenario, ironic reference was made by one NRW respondent to the phenomenon of “national slurry spreading day” (NRW interviewee 03). Namely:

“The first day [after the closed period], hell or high water, raining or whatever, it’s going out. Hell, or high water, farmers do everything to get rid of slurry without any concern for the environment or soil at the first day of allowed spreading. Because some farmers have intensified and increase their livestock numbers with imported feed, but not their storage facilities or area of land, they have no other choice.” (NRW interviewee 03)

Despite being strongly against the depicted ‘hell or high water’ approach to slurry spreading, this respondent also nevertheless acknowledges what they see as ‘the lack of choice for many farmers’. In effect, the regulation in combination with the operating context produces a situation in which some farmers lose the ability, or even the will, to care (West et al., 2018).

In accordance with the above depiction of how NVZ compliance is actually being practiced in Wales, respondents from the farming sector repeatedly voiced the view that the short window for slurry spreading was detrimental to good farming practice; not only to the financial health of their businesses but also, perversely, to the environment. Points raised in support of this argument, covered a full
range of consequentially adverse environmental practices, from over-application (in order to empty slurry stores), to mis-placed application, to mis-timed application (in terms of optimising crop growth), to damage to soil structure and animal health issues. In the case of the WG consultation in particular, a thread running through many of the responses was the impracticality of having to be dictated to by fixed calendar dates:

“Weather conditions can be just as prohibitive just before and just after the closed period. This could quite possibly initiate poor spreading decisions, and lead to just exactly the problem that the proposal would seek to avoid. This effectively leads to farming by the calendar.” (WG Consultation- R72)

“Running a farm according to a strict calendar of date when application of manures to field can take place is likely to result in a higher risk of nutrient leaching in the days and weeks leading up to the closed period and immediately after it finishes. Farmers should be allowed to manage their farms according to best practice and weather/soil conditions/land use.” (WG Consultation- R80)

“The dates do not reflect the location we farm [...] grass grows through the winter but springs can be very wet. It should be relative to your farm in a personal justified farm plan.” (Questionnaire respondent 02).

The above extracts provide an illustration of the many comments made to this effect during the WG consultation (2017). What they also demonstrate, however, is an interpretation of the NVZ rules whereby the opening and closing dates for slurry spreading are seemingly ranked by farming respondents as being of higher order than the remainder of the specifications contained within the regulation. For example, although consultation respondent R77 argues that “weather and ground conditions should be the deciding factor”, in effect this is already a central tenant of the NVZ rules. As noted earlier, in addition to not spreading during the closed period the regulation requires that during the open period spreading should only take place when the weather and ground conditions are suitable for doing so. Accordingly, if it turns out, as R72 points out (above), that weather conditions are “just as prohibitive just before and just after the closed period”, then compliance with the NVZ would mean that slurry spreading should not take place during these times either. Whereas the NVZ incorporates closed periods into a broader set of requirements aimed at ensuring slurry spreading only takes place during suitable conditions, for the farmers the closed period is counterproductive to achieving this aim. The reason for this differing interpretation likely lies in the operating context already outlined above. For many dairy farmers especially, achieving compliance with the NVZ, renders it necessary for them to adopt an extremely narrow and partial interpretation of the regulation.

The flexibility of a scheme to allow farmers to operate their chosen farm management plan is also a key component of whether voluntary schemes are adopted. For instance, in a survey of ten EU countries including the UK, the top reason (at 50%) stated by farmers as ‘very important’ for non-participation in schemes was that the scheme ‘did not fit in with farm-management plans’ (Wilson and Hart 2000). In the case of Wales, in addition to the somewhat selective interpretation of what compliance with the NVZ actually constitutes, the responses across the three data sets reveal a
tendency by farmers to perceive the artificial rigidity of fixed closed dates as undermining their ability to act as good farmers: “Good agricultural practice should dictate timeliness and not prescribed dates” (WG Consultation- R68 (emphasis added)). In the case of the consultation, this was commonly explained to WG on the basis that it created a situation in which farmers risked being made to work against, rather than with, ‘Mother Nature’:

"Nature does not live by a calendar. There can be tighter guidelines about appropriate slurry and muck application and Farming Connect could reinforce this message but a closed period is senseless when measured against Mother Nature." (WG Consultation- R2)

By specifically incorporating, within her five phases and elements of care, the responsiveness of the care receiver, Tronto (1993; 2013) reinforces the relational nature of care practice. This relationality is equally applicable to the practicing of environmental care. For good environmental care to be achieved in a farm setting farmers need to be able to blend proactive and reactive forms of resource management, underpinned through practice by an intimate knowledge of the farm environment, as well as a sensitivity for either shorter or longer term periods of temporal change (Tsouvalis, 2000). Fundamental here is the farmer’s attentiveness to continuously reading and re-reading the land over time, not their observance of a calendar (Mol et al., 2010).

The absence of a buffer in slurry storage capacity on many dairy farms results in a minimum standard of NVZ compliance (namely, no spreading during closed periods), with this in turn also becoming the basis for the monitoring of farm practice by NRW across all farming types. The earlier depiction by an NRW respondent of ‘national slurry spreading day’, whereby ‘come hell or high water it’s going out’, reflects this situation. Under the current low land area coverage of 2.4% in Wales, the relatively small number of farmers located within an NVZ enables NRW staff to undertake reasonably regular farm visits. This permits a more place-based and educational approach to supporting farm-level improvements in practice. As two of the NRW respondents (NRW interviewees 01 and 02) explained, they are able to engage in face-to-face dialogue with the aim of identifying and explaining enhancements to practice in a manner capable of securing a farmer’s support. All three NRW respondents, however, expressed personal concern about the possibility of being able to continue with such an approach should the NVZ area be increased. On-going cut backs to resources within the organisation were said to make it highly unlikely that it could be comprehensively continued even at 8% land area coverage. Even where NRW officers were able to build up relationships of trust supportive of encouraging farmers to make more substantive changes to their current practice, though, this in itself was not always the deciding factor (Enticott & Franklin, 2009; Ortolano et al 2009).

Although it is incumbent upon farmers to meet the requirements of NVZ regulation, the practical requirements for compliance sometimes necessitates the involvement of other bodies, which itself creates further challenge. In the case of slurry storage, for example, a mutual challenge for the NRW officers, and for some of the farmers alike, was in securing the necessary planning permission to enable a change to take place:

“... you get into national park areas [...] of course they can’t influence what’s there already, so maybe two or three broken or defunct slurry tanks with slurry leaking, but they don’t want a new one built [...]. We’ve had issues, yeah, where planners have gone, you know NVZ regs are
that you need to sort this out, you know, for pollution requirements you need a nice new slurry tank and the planners have gone ‘no, we don’t want…’” (NRW Interviewee 01).

The scenario described by the above respondent provides a good example of the difference between an obligation based and responsibility based approach to environmental care (Edwards 2009); the potential for it to give a mixed message to farmers regarding institutional attitudes towards slurry management is clear. In other cases, instances were given of where, in order to secure regulatory consent for additional storage capacity, it required an approach which accepted prioritisation of social and aesthetic factors over environmental ones. Instances such as these reflect the fact that the ‘care multiple’ (Law, 2010) that farmers have to contend with and choreograph on a daily basis are further complicated by the care multiples of other rural stakeholders (Krzywoszynska, 2016).

Navigating the Nitrates Directive: accommodating NVZ ‘compliance’ within the farming year

In parallel to farmers presenting their own experiential evidence as to why the NVZ regulations were undermining their ability to perform ‘good’ farming practice, a number of respondents also questioned the scientific basis for the regulations. The limited acceptance by the farming community of government endorsed scientific evidence to explain and enforce the Nitrates Directive, is a problem which extends beyond Wales (House of Commons, 2008; Ortolano et al 2009). Across all three data sets, for example, farmers expressed a lack of conviction as to the contribution that NVZs make to water quality. “Very little, a lot of nutrients both nitrate and phosphate are coming from sewage plants” (Questionnaire respondent 9). Similar sentiment was expressed during interview:

“If they can come to us and say, in this area, we brought this regulation in and nitrate levels have dropped significantly, I can understand carrying on, but if they say they’ve brought all this legislation in and nothing’s happened to the water, the problem’s come from somewhere else hasn’t it.” (Farmer Interviewee 03).

Beyond doubting the scientific evidence and reporting of impact, WG were further accused by another interviewee (Farmer Interviewee 06) of introducing targets for political purpose. They were also criticised for failing to acknowledge the role and responsibility of other groups in safeguarding water quality:

“This could be a paper exercise simply to meet targets. We are told that this is not acceptable and that levels must be seen to be reducing. We need to know exactly what the figures are! What really infuriates me is that the levels of nitrate attributed to agriculture are not being addressed at the same time as the levels of phosphates well known to emanate from urban populations - grey water, etc. […] An urban public also ought to be educated and know the impact of their own actions in relation to phosphate pollution. Responsibility should not be completely devolved to the farmer.” (WG Consultation- R249)

The propagation of a popular narrative within the farming industry of a lack of robust scientific evidence makes the task of encouraging farmers to change to their existing practice even more challenging (Hayman & Alston 1999). By using their own experience and observations to question the credibility of the regulatory guidance, farmers are at the same time able to rationalise non-compliance as being in-keeping with, rather than at odds with, environmental care. In the case of the NVZ, this framing extended also to their reporting of the mitigation measures taken by some farmers to conform to the regulatory requirements - either upon their own initiative, or in accordance with the
recommendations of the regulatory authorities. Two of the NRW respondents recounted how, for example, from the very first year of the NVZ being in place, some farmers had started out-wintering stock more. Reportedly, the rationale for doing so was in order to compensate for a lack of on-farm slurry storage space. The outcome, however, in the personal opinion of the NRW respondents, was that this had resulted in further environmental detriment (NRW interviewee 01). Similar sentiment was expressed by one of the WG consultation respondents in their citation of an associated technical memo:

“[… the first reaction was to out winter more cattle so slurry storage was within calculations. This increase[s] potential for soil and faeces run off into streams. […] we have observed the deterioration in water quality since designation and peaks in poor water quality in October and February due to increased slurry applications either side of the closed periods, as shown in NRW Tech. Memo TMW16_26. […]” (WG Consultation- R247)

From a care multiple perspective (Law, 2010), examples such as these further illustrate the difficulty faced by farmers and regulatory authorities alike in “resolving the tension between the different cares” (Krzywoszynska, 2016: 299).

The lack of trust in the science of the NVZs was further used by respondents to demonstrate perceived failings of both the WG and NRW for not incorporating the situated expertise of the farmers. Reflective of the existence of varying perspectives on what at any moment, or place, might constitute the right sort of care (Parr, 2003), numerous suggestions were made as to how the management of nitrates could be improved. This included – but was not limited to - the replacement of the closed spreading period with a more flexible, context specific approach to slurry application:

“… surely it would make more sense for the farmers to keep spreading all winter […] you know, I’m not a highly educated man but I do understand how […], surely a little more often is better than everybody going out in the same week” (Farmer Interviewee 03)

Evident also in the farmers’ concerns about the overly rigid nature of the NVZ regulation was an understanding that care – be it in a farm or hospital setting – “is not something that is unproblematically or simply ‘given’” (Parr, 2003:217). Rather, as Parr explains, “it is better conceptualised as ‘a series of precarious achievements’” (p217; see also West et al 2018). Accordingly, in their responses to the WG consultation farmers raised the question of with whom responsibility would rest should their adherence to the regulation result in something other than good environmental care being the outcome:

“Dates, closed periods and one-size-fits-all approaches may make administration simpler, but the practicalities when it comes to implementing them in real life may be worlds apart in difficult years. In those difficult years, what guarantees are there that farmers won’t be persecuted for problems beyond their control. Even with the best facilities on paper there will be times when nature permits us to spread and times when it won’t. During these times how do we let common sense prevail? ” (WG Consultation- R2)

A personal comment was made by a WG respondent during the course of the research that some institutional representatives tend to justify the farming industry being a problem, in a way which creates “an acceptance of being the problem, but not an acceptance of the responsibility” (WG meeting– 04-05-18). In contrast, reflected in the above quotation - and a number of the other responses besides - is a fear on the part of some farmers that, even if they are doing exactly as directed, it will nevertheless be they that are blamed should anything go wrong:
"Will the decision always be left with the farmer to decide if conditions are safe to cultivate? Or equally is the decision left with the farmer to decide if rough cover is suitable and no further work required? If the authorities decide to question the decision, what safeguards does the farmer need to prove they made the appropriate decision?" [Response to WG consultation question: 'Do you think cover crops should be included in the Action Programme?'] (WG Consultation- R2)

This fear, that blame will be attributed to the farming community regardless of fault, reflects the daily challenge faced by many farmers, of having to navigate on the one hand, the pressures of conventional agricultural systems – characterised very often by intensive, high input industrial style production; and on the other hand, the environmental impacts of doing so. In summary, it reflects the on-going struggle of being a ‘good farmer’. The human consequence of this long-running and ever tightening challenge, is an increased feeling of vulnerability on the part of many farmers; a vulnerability which, for smaller scale family farmers especially, does not merely have financial or environmental ramifications, but also psychological ones. As such, in the context of this study, it is too simplistic to view a resistance to the imposition of environmental regulation as suggestive of a weakened commitment to good farming practice, or indeed to environmental care. Rather, for small scale conventional dairy farmers in particular, it is more likely fuelled by a need for self-protection against increased vulnerability - especially where government regulation is perceived to invoke further loss of agency and autonomy on the part of the farmer:

"... dairy farms have been struggling to make a profit with most making losses, and with the new proposed minimum five month storage plans where are we going to get the money from to do this? To make these changes with no sign of grants or schemes to help farmers cope with these new proposed measures [are] just leading all farmers down a blind alley." (WG Consultation- R218)

Further aggravating the arguments put forward by respondents against the NVZ regulation, and as a defence to their own restricted compliance, was the belief that ultimately the practice of ‘bad’ farmers would not change: “The regulations don’t take away the bad farmers. It’s the bad farmers that cause the trouble, the good farmers adhere to the legislation [...] the legislation does nothing to the bad farmers” (Farmer interviewee 03). The rationale for this was not only the perceived flaws in the regulation, but also a lack of effective enforcement on the part of NRW:

“... I have got a friend who is in an NVZ and they said to him, ‘you’re all in NVZ how do you get around it?’; he said, ‘lie’. And everybody does, you bend the truth a little bit.” (Farmer Interviewee 02)

Lack of effective enforcement and an inability to verify compliance has also been found to be an issue in other EU countries, for instance, in Brittany some farmers have used this as an incentive to ignore requirements (Ortolando, Baumon and Puz 2009).

Personal concern was expressed by WG respondents that some institutional representatives of the farming industry are encouraging farmers to distance themselves from responsibility for any environmental harm. Missing from this observation, however, was any parallel reflection on their own potential to negatively influence the willingness of the farming community to retain primary responsibility for abating nitrate pollution. The nature of the NVZ regulations, in terms of its top-down style of governance, enforcement and monitoring, suggests a continued favouring of what Enqvist et
al. (2018:26) refer to as “technocratic norms that assume managers, policy-makers and scientists can guide action to sustainability in a detached and objective manner”. What this also suggests, is an institutional (mis)belief that imposing a formal obligation upon an individual, in such a way, will automatically serve to promote their personal acceptance of responsibility. As West et al., (2018:7) note “a defining aim of sustainability [is] fostering close, generative and ongoing relationships between people and their environment”. In contrast, the nature of the NVZ regulation sees it conforming much more closely to Tronto’s notion (as set out above) of an ‘obligation-based’ approach to responding to the needs of others; that is, an approach which erroneously enforces a separation of the social from the ecological. Such an approach serves to undermine rather than to nourish first-hand responsibility for environmental care.

Conclusions

We began this paper by bringing together the concepts of the good farmer and the practicing of good care. In applying them to a case study of farming practice within the existing and proposed NVZs of Wales we asked firstly: how are fixed practices of environmental care, as prescribed through regulation, encountered and navigated by (dairy) farmers in their everyday practice - and to what effect? And, secondly: where deviances occur from prescribed environmental care practices, how do individual (dairy) farmers attempt to narrate and rationalise these without undermining a good farmer identity?

The case study of Wales confirms that good environmental care can never be achieved through regulation alone (Barnes et al 2013), but it also demonstrates that this is only one part of the challenge. There is a parallel risk that the difficulties of complying with the obligations imposed by compulsory legislation results in both a self-mitigation and a distancing of responsibility by affected individuals in a manner which nevertheless still allows them to care, yet without being responsible for care. This is especially so where such regulation creates potential conflict with other well-established (tangible and intangible) rules of the game (Lareau et al., 2016). That is, by offering their own evidenced account for why particular components of a regulation are ill conceived and highly problematic to implement, farmers can on the one hand demonstrate their intention and ability to care (i.e. their conformity to the ideals of good farming), whilst at the same time explain away (including by apportioning to others) responsibility for any actual failings. This leads us to conclude that, where a regulatory codification establishes an overly rigid prescription for the practicing of environmental care, this can actually have an adverse effect on the very resources which the legislation is meant to protect.

In the case of the Wales NVZs, the perceived imposition of by-calendar farming is creating a situation in which conventional dairy farmers feel motivated and legitimated in paying less attention and being less responsive to the condition of their land. Misapplication of slurry, for example, is reframed by some farmers, not as detracting from their status of being a good farmer, but rather, as evidencing their commitment to being one. It is the regulation, we were told, which obliges them to act in such a way in order to protect the very viability of their farm. In the longer term, by becoming less familiar and practiced in reading the land, there is a risk that these farmers will be less “attuned to the particular ways in which the environment unfolds” as well as less aware and sensitive to their own ability to participate in its unfolding (Krzywoszynska, 2016: 292). In effect, in totality, such a scenario
equates to a loss of all three of the elements that, according to Tronto (1993) make up good care by a
care giver: attentiveness, responsibility and competence.

Understanding the ways in which pieces of environmental legislation are navigated at farm, catchment
and national level, as well as the ways in which they variously serve to alter, reinforce, or even
entrench differing conceptions of what constitutes ‘good’ environmental care practice and by whom,
is crucial. Increasing our understanding of both the intended and unintended consequences of agri-
environmental legislation can be used to inform the writing of future legislation, but also the ways in
which it is administered at farm and catchment level by the regulatory authorities. Both, as we have
demonstrated throughout this paper, require greater sensitivity towards the struggle endured by
stakeholders, individually as well as collectively, in navigating good farming practice in the space
between environmental stewardship and intensive models of agricultural production. Further
research is needed on how codification of care in regulation effects the actual practicing of care on
the ground, as well as other instances in which farmers risk losing the ability, or feel compelled to
continue distancing themselves from the responsibility, to care. Relevant also here are the impacts of
changing climate conditions. At a time when farmers need to develop greater adaptability and
responsiveness to the environment of their farm, in order to cope with adverse climatic conditions, it
is important that environmental regulation is administered in a manner which is similarly attuned.
What works in one year, for instance, cannot automatically be assumed to work equally well in the
next. Moreover, where a failure occurs in environmental care despite environmental regulation being
in place, the responsibility for this does not rest with farmers alone. In an operating context in which
many conventional farmers find themselves closer these days to a ‘dead end’ than a ‘cross roads’
(Lowe & Ward 1998), it becomes all too easy for individuals, but also whole institutions, to lose sight
of their underlying responsibility for environmental stewardship.

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