

The Art of Governing through Multiplicity

Everyday Practices and Transitions in UK Agri-Environmental Governance

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Neuchâtel, le 23 juin 2023

Le doyen
Louis de Saussure

Abstract

This thesis aims to uncover transitions in agri-environmental governance [AEG] in the UK through the lens of everyday practices. Building on long-term ethnographic fieldwork and supported by different theoretical framings, it documents and analyses the mobilisations and social uses of four specific agri-environmental governance instruments in a series of research papers. The first paper draws attention to payments for ecosystem services [PES] and the practices used to inspire market-style transformations in Welsh AEG. Employing Murray Li's (2007) practices of assemblage the findings show a mosaic of different PES arrangements emerging which serve and reflect diverse interests and needs. The second paper engages with the principles of partnership working to combat agricultural diffuse pollution in Herefordshire. Through the lens of Sheila Jasanoff's (2004) instruments of coproduction this paper shows how farmers are proactively nudged towards better land management practices by a multi-actor partnership via their collective attempts to re-shape identities, institutions, representations, and discourses. This partnership work produces place-based versions of good farming which seek to reconcile rather than divide profitability and ecology in farming. The third paper investigates the establishment and ways of working of the Pasture-fed Livestock Association, a UK-wide food label and farmer-driven organisation based on grain-free livestock production standards. Using Lave and Wenger's (1991) situated learning theory this case study demonstrates how a private food label can also act as a community of practice stimulating social learning and unlearning between its members through virtual and non-virtual means of engagement. The empirical material of this paper generates novel insights about the role that such communities of practice can play in bringing marginalized practices, knowledges and products to people's minds and markets. Finally, the fourth paper explores and contrasts socio-technical imaginaries (Jasanoff, 2015; Jasanoff and Kim, 2009) of digitised agri-environmental governance with the challenges of implementing these technologies in everyday contexts of various governance stages and actors. This final paper reveals how various digitalisations both transform the configurations of agri-environmental governance practices and agri-environmental knowledge in challenging and productive ways. Collectively, the papers document the shift towards a new art of governing through multiplicity. Whilst earlier iterations of UK AEG were directly aimed at producing policy or market interventions for clearly defined target populations (i.e. farmers), this new art of governing is less explicit about whom to govern and more concerned with what to govern. Overall, the findings of this thesis demonstrate the benefits of employing an everyday perspective to uncover such governance transitions including the diverse motivations and mundanities that are part of devising meaningful AEG practices within a governance system premised on multiplicity. It also demonstrates the changes in power relations and knowledge regimes due to the mobilisation of new governance instruments and the authorisation of specific forms of knowledge and associated learning processes. Eventually, the thesis makes the case for AEG research and practice to become more socially informed, sensitive to questions and relations of power, and interested in the networked performance of multiplicity to act upon its (dis)connections and unleash more of its transformative potential.

Keywords: Agri-environmental governance, Payments for ecosystem services, Partnership working, Communities of practice, Digitalisation, United Kingdom

Résumé

Cette thèse vise à découvrir les transitions de la gouvernance agro-environnementale [AEG] au Royaume-Uni à travers le prisme des pratiques quotidiennes. S'appuyant sur un travail de terrain ethnographique de longue haleine et soutenu par différents cadrages théoriques, il documente et analyse les mobilisations et les usages sociaux de quatre instruments de gouvernance agro-environnementale spécifiques dans une série de documents de recherche. Le premier article attire l'attention sur les paiements pour les services écosystémiques [PSE] et les pratiques utilisées pour inspirer les transformations de type marché dans l'AEG gallois. En utilisant les pratiques d'assemblage de Murray Li (2007), les résultats montrent une mosaïque de différents arrangements de PSE émergeant qui servent et reflètent divers intérêts et besoins. Le deuxième article aborde les principes du partenariat œuvrant pour lutter contre la pollution diffuse agricole dans le Herefordshire. À travers le prisme des instruments de coproduction de Sheila Jasanoff (2004), cet article montre comment les agriculteurs sont poussés de manière proactive vers de meilleures pratiques de gestion des terres par un partenariat multi-acteurs via leurs tentatives collectives de remodeler les identités, les institutions, les représentations et les discours. Ce travail partenarial produit des versions territorialisées de la bonne agriculture qui cherchent à réconcilier plutôt qu'à diviser rentabilité et écologie dans l'agriculture. Le troisième article étudie la création et les méthodes de travail de la Pasture-fed Livestock Association, une organisation britannique de labels alimentaires et d'agriculteurs basée sur des normes de production animale sans céréales. En utilisant la théorie de l'apprentissage situé de Lave et Wenger (1991), cette étude de cas démontre comment un label alimentaire privé peut également agir comme une communauté de pratique stimulant l'apprentissage social et le désapprentissage entre ses membres par des moyens d'engagement virtuels et non virtuels. Le matériel empirique de cet article génère de nouvelles idées sur le rôle que ces communautés de pratique peuvent jouer en apportant des pratiques, des connaissances et des produits marginalisés aux esprits et aux marchés. Enfin, le quatrième article explore et oppose les imaginaires sociotechniques (Jasanoff, 2015 ; Jasanoff et Kim, 2009) de la gouvernance agroenvironnementale numérisée aux enjeux de mise en œuvre de ces technologies dans les contextes quotidiens des différentes étapes et acteurs de la gouvernance. Ce dernier article révèle comment diverses numérisations transforment à la fois les configurations des pratiques de gouvernance agroenvironnementale et les connaissances agroenvironnementales de manière stimulante et productive. Ensemble, les articles documentent le passage à un nouvel art de gouverner par la multiplicité. Alors que les versions précédentes de l'AEG britannique visaient directement à produire des politiques ou des interventions sur le marché pour des populations cibles clairement définies (c'est-à-dire les agriculteurs), ce nouvel art de gouverner est moins explicite sur qui gouverner et plus préoccupé par ce qu'il faut gouverner. Dans l'ensemble, les résultats de cette thèse démontrent les avantages d'employer une perspective quotidienne pour découvrir de telles transitions de gouvernance, y compris les diverses motivations et banalités qui font partie de la conception de pratiques AEG significatives dans un système de gouvernance fondé sur la multiplicité. Elle montre également les changements dans les rapports de force et les régimes de savoirs dus à la mobilisation de nouveaux instruments de gouvernance et à l'autorisation de formes spécifiques de savoirs et de processus d'apprentissage associés. Finalement, la thèse plaide pour que la recherche et la pratique AEG deviennent plus informées socialement, sensibles aux questions et aux

relations de pouvoir, et intéressées par la performance en réseau de la multiplicité pour agir sur ses (dé)connexions et libérer davantage son potentiel de transformation.

Mots clés : Gouvernance agro-environnementale, Paiements pour services écosystémiques, Travail en partenariat, Communautés de pratique, Digitalisation, Royaume-Uni

Contents

ABSTRACT	III
RÉSUMÉ.....	IV
LIST OF FIGURES	VIII
LIST OF TABLES.....	IX
LIST OF ACRONYMS AND ABBREVIATIONS	X
ACKNOWLEDGEMENTS	XII
PART I: INTRODUCTION	1
Chapter 1 – Why and how to explore everyday practices and transitions in agri-environmental governance?	2
1.1 Background and research objective	2
1.2 Conceptual and analytical framework	4
1.3 Research Questions	9
1.4 Research Design	10
1.5 Methodology.....	15
1.6 Positionality	22
1.7 Contributions and limitations	26
1.8 Outline	28
PART II: FINDINGS.....	30
Chapter 2 – Assembling payments for ecosystem services in Wales	31
2.1 Introduction	32
2.2 Assembling Governance.....	34
2.3 Case analysis.....	37
2.4 Transforming Agri-Environment Schemes	38
2.5 The Pumlumon Project	42
2.6 Ecosystem Enterprise Partnership - Ecobank [EEP-Ecobank]	45
2.7 Discussion and Conclusions.....	48
Chapter 3 – Co-producing better land management? An ethnographic study of partnership working in the context of agricultural diffuse pollution	52
3.1 Introduction	53
3.2 The idiom of co-production and its relevance in agri-environmental contexts	55
3.3 A note on methods: Studying partnership working through the ethnographer's lens	58
3.4 The turn towards partnership working in Herefordshire.....	60
3.5 Exploring the co-products of Farm Herefordshire.....	65
3.6 Conclusion: A hopeful appraisal of partnership working	76

Chapter 4 – Social (un-)learning and the legitimization of marginalized knowledge: How a new community of practice tries to ‘kick the grain habit’ in ruminant livestock farming	79
4.1 Introduction	80
4.2 Communities of practice, knowledge sharing and the notions of unlearning and legitimacy	82
4.3 Methodology.....	86
4.4 Cultivating a new community of practice: The story of the PFLA.....	89
4.5 Exploring the success factors of the CoP	103
4.6 Conclusion	109
Chapter 5 – When sociotechnical imaginaries meet everyday practice: Digitalisation and the transformation of agri-environmental governance practices and knowledge	112
5.1 Introduction	113
5.2 Key concepts.....	114
5.3 Methods.....	117
5.4 Four examples of everyday encounters with digitalisation	117
5.5 Discussion: Altering options and choices for knowing and decision-making	129
5.6 Conclusions.....	132
PART III: CONCLUDING DISCUSSION	134
Chapter 6 – The lessons learnt from studying everyday practices and transitions in UK AEG	135
6.1 The value of uncovering everyday governance practices	136
6.2 The changing power relations and knowledge regimes in AEG.....	137
6.3 The strengths and weaknesses of governing through multiplicity.....	141
6.4 Towards socially informed, power-sensitive, and transformative AEG	144
BIBLIOGRAPHY	146
APPENDIX.....	168
1. List of interviews.....	168
2. List of attended events and activities conducted to gather direct observations	169

List of Figures

Figure 1: A graphic depiction of the role of this PhD project within the wider research project.	5
Figure 2: An illustration of the patchwork of AEG instruments and networks explored in this thesis.	14
Figure 3: The number and types of participant observations undertaken during fieldwork.	17
Figure 4: A word cloud showing the most frequently mentioned words within titles of discussion threads within the PFLA Google Group.	22
Figure 5: Map of Wales showing the two project locations.	38
Figure 6: EEP-Ecobank Stakeholders.	46
Figure 7: Location of the river Wye, the catchment area and the county of Herefordshire.	63
Figure 8: (a) Place branding logo of Herefordshire county; (b) the modified logo of Farm Herefordshire	67
Figure 9: The specific farming practices promoted by Farm Herefordshire.	69
Figure 10: Participants take soil samples to assess the health of soils during a farm walk organised by Farm Herefordshire.	72
Figure 11: Screenshot of Farm Herefordshire YouTube video, showing John in front of his Mizuri strip-till drill.	74
Figure 12: Timeline showing the major milestones in the development of the PFLA.	92
Figure 13: The picture shared by Joanne to illustrate her grazing management during the dry spell of 2018.	95
Figure 14: The picture shared by Ted in the discussion thread ‘Coping in the dry weather’.	97
Figure 15: The steps involved in Soilpatrol as documented by the EA’s Environment Manager on Twitter, 9 February 2017.	121
Figure 16: Glastir Targeted Element map showing different priority areas to deliver for water quality.	124
Figure 17: Page 1 of the DIY plate meter plans shared within the PFLA forum.	128
Figure 18: Page 2 of the DIY plate meter plans shared within the PFLA forum.	128

List of Tables

Table 1: Types of documents analysed in this thesis.....	20
Table 2: Practices of assemblage	36
Table 3: The four instruments of co-production.....	56
Table 4: Overview of research methods and data.....	58
Table 5: The organizations currently involved in the Farm Herefordshire partnership	61
Table 6: Summary of internal survey results.	102

List of Acronyms and Abbreviations

AEG	Agri-environmental governance
AGM	Annual General Meeting
AHDB	Agriculture & Horticulture Development Board
CAP	Common Agricultural Policy
CFE	Campaign for the Farmed Environment
CoP	Community of Practice
DEFRA	Department for Environment, Food & Rural Affairs
EA	Environment Agency
EEP-Ecobank	Ecosystem Enterprise Partnership - Ecobank
EU	European Union
FH	Farm Herefordshire
GIS	Geographic Information Systems
MWT	Montgomeryshire Wildlife Trust
NE	Natural England
NFU	National Farmers Union
NGO	Non-governmental organisation
NRW	Natural Resources Wales
OFWAT	Water Services Regulation Authority
PCF	Pembrokeshire Coastal Forum
PES	Payments for ecosystem services
PFLA	Pasture-fed Livestock Association
SMS	Sustainable Management Scheme
UK	United Kingdom
WG	Welsh Government

To Vera & Samuel

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Thomas Vetter, Wood House, Whitney on Wye, April 2023

Part I: Introduction

Chapter 1 – Why and how to explore everyday practices and transitions in agri-environmental governance?

1.1 Background and research objective

Academic debates about agri-environmental governance [AEG] over the past few decades have shown that scholarly interest remains firmly centred on one key question. That is: How can agri-environmental governance be made more effective for it to *truly* steer agriculture and food systems onto more sustainable pathways? Previous answers to this question, for example, foresaw that publicly funded agri-environment schemes, which compensate farmers for any losses incurred from environmental land management practices, should become more targeted, results-oriented, culturally sensitive and collaborative (Burton and Paragahawewa, 2011; Burton and Schwarz, 2013; de Sainte Marie, 2014; Emery and Franks, 2012), whereas public policy making within this field was envisaged to become more participatory, adaptive, reflexive and joint up (Lee, 2014; Marsden, 2013; Mason and Lang, 2017). Beyond this *traditional* governance focus on agricultural production and the role of the state, agrifood scholars have also called attention to the rise of private standards and alternative food networks (see for example Goodman et al., 2012). Doing so has highlighted the role of non-state AEG actors, including farmers, retailers, and consumers, in extending and challenging public policies and governance approaches, and arguably also in driving more systematic change from farm to fork.

On one hand this research attention is the logic consequence of the severe limitations – if not failures – of previous and contemporary attempts to govern the agri-environment in a sustainable manner. These attempts simply have not had the desired effects, neither environmentally nor socially. This has become perhaps most obvious in the case of public AEG instruments such as the EU's Common Agricultural Policy [CAP], which have been widely criticised for their ineffectiveness to prevent further biodiversity loss, environmental fragmentation and degradation or climate change (Emery and Franks, 2012; Pe'er et al., 2020, e.g. 2014), as well as for their inadequacy to change farmers' behaviours and practices towards the environment in any fundamental way (Brown et al., 2021; Burton and Paragahawewa, 2011). However, shortcomings and limitations have also been identified and recognised in relation to various certification schemes and local food networks. For example, the appropriation of organic agriculture by agribusiness can

lead to intensification and dilute some of the principles and benefits of more environmentally-friendly ways of farming (Guthman, 2004).

On the other hand, this research attention also reflects new understandings, expectations, and desires that academics, practitioners and societies at large have come to associate with changes and innovations in AEG, and which have led to recurring calls and propositions for improvement, more efficacy, reform and redesign. For instance, high hopes have been placed on the development of market-based governance instruments such as payments for ecosystem services [PES] to counteract market failures and to allow farmers to capitalise on the production of non-provisioning ecosystem services. So-called agri-environmental collaboratives have been proposed as an alternative to funding environmental land management practices on single farms. Such collaboratives include groups of farmers and can be geared towards landscape scale management, which is believed to be much better suited for the management of connected natural features and functions. Calls for wider collaboration between different agri-environmental stakeholders have also been made, giving rise to multi-actor partnerships which may produce more balanced outcomes between competing demands. And, of course, digitalisation has been touted as a harbinger of transformative change from the ways farmers do agriculture to how governance is done to better control it.

Thus, given the many unresolved issues, open questions, dynamics and multiplicity of governance approaches the unabating scholarly interest in this key governance question is therefore not surprising. In fact, agrifood scholarship itself represents an important part of a much wider societal and reflexive exercise which seeks to make sense between *what is* and *what could be*. In other words, understanding the practices and transitions of agri-environmental governance remains critical and our scholarship does contribute to the formation and manifestation of possible governance futures (see also Carolan, 2015).

To this end this thesis follows in the footsteps of this literature and aims to contribute to the ongoing search for better solutions. However, I will not and cannot promise the readers of this thesis any neat and straight-forward answers as the main objective is a more modest one: This thesis aims to uncover transitions in agri-environmental governance in the UK through the lens of everyday governance practices to elicit some of the dynamics that are inherent to the mobilisation and social uses of governance instruments. I believe there is tremendous scope and

value in studying concrete social uses of AEG, as such a perspective can reveal much about AEG in actual practice, including how people appropriate, translate, and make sense of governance instruments to achieve diverse ends.

The use of the word transition is intentional in this context as it allows me to approach the topic of AEG in the UK with an open mind as to what constitutes and qualifies change within ever evolving governance regimes and arrangements. This is important to make clear from the beginning, because I employ a broad understanding of the governance term in this thesis. Here, I align with other agrifood scholars who have argued that governance

‘means more than simply what government does. It refers to the entire process of decision-making: how decisions are made, by whom and with what effect. Governance includes the style and mode of decision not just the decision itself, and draws attention to the role of values not just facts [...] governance analysis requires us to consider whether the discourse and process are completely open and transparent, and to be clear about their moral as well as material context. (Mason and Lang, 2017, p. 261)

Thus, in contrast to narrower definitions and understandings of governance which might distinguish between certain types of actors (e.g. state, market and civil society) or sets of instruments (e.g. policies, private certification), I take inspiration in an assemblage-inspired reframing of AEG (Forney et al., 2018a). This emergent field of research calls for more transversal and less dichotomist analysis (Forney, 2016), which acknowledges and documents the multiplicity, complexity and meddling that we see on the ground and which we perhaps understand more clearly today.

In the following I will introduce in more detail the research design and approach employed in this thesis. I will touch upon key concepts, specify my research questions, and reflect upon the contributions and limitations of this research project, before outlining the remaining chapters of this article-based dissertation.

1.2 Conceptual and analytical framework

This thesis was informed and guided by a larger research project in which this PhD was embedded. This larger research project called *“New Directions in Agri-Environmental Governance: Re-assembling Food, Knowledge and Autonomy”* was conceptualised by Professor Jérémie Forney, Project Leader and supervisor of this thesis (Forney, 2014). Funded by the Swiss National Science Foundation this 4-year research project ran from June 2015 until May 2019. The project set out to empirically document and analyse the diversity of agri-environmental governance

instruments and practices through various national and transnational ethnographic case studies (see Figure 1).



Figure 1: A graphic depiction of the role of this PhD project within the wider research project.

Realisation: Author.

Consequently, the conceptual and analytical point of departure of this thesis lies in the observation that concrete practices ultimately determine the outcomes and implications of any governance intervention, be it an agri-environmental policy, a private food label, or a multi-stakeholder initiative (Forney, 2016). Therefore, careful attention to everyday contexts and people's lived experiences is key to uncover and assess the social uses that various actors make of different governance instruments.

Such a perspective recognises *'the added value of the "instrument approach" to analyze policy changes'* (Lascoumes and Le Gales, 2007, p. 17), but it extends this to governance more broadly; and importantly it does not limit the analysis to the tool itself, but it takes interest in the governance networks or assemblages that develop around it and to the agents that make use of it. This reflects an emergent theorisation of AEG that acknowledges and interrogates the multiplicity and diversity of governance which characterises contemporary agri-food systems. In this understanding AEG is used

'as a broad framing that encompasses the multiple actions, which aim to implement change in the food system and address environmental issues

related to agricultural production. Beyond the original intention of any governance action, localised uses, specific networks and practical norms emerge in a process of interaction, translation and reinterpretation that we can call AEG practices.' (Forney et al., 2018b, p. 2)

A key feature of reframing AEG in this way is that it tries to avoid particularistic views by diverting researchers' attention away from preconceived theories and categories of governance towards practices on the ground. In other words, it follows in the footsteps of weak theory, which maintains a healthy and critical distance to any totalising narratives and instead searches for more refined, nuanced and indeed hopeful explanations of real life phenomena through thick description (Carolan, 2018; Geertz, 2008; Gibson-Graham, 2014). This favours an anthropological research perspective which is attentive to everyday aspects and meanings of governance, but also fully aware of strong theories and its stabilising factors such as '*powerful discourses that organize events into understandable and seemingly predictable trajectories*' (Gibson-Graham, 2014, p. 147). With this in mind, I set out to explore AEG in the UK. However, of course this does not mean that I have ignored any theories *per se*. On the contrary, what I found in the field has informed the theoretical framing by pointing me towards several analytical concepts which I found useful to *think with* and *to think through* my empirical material. Lastly, this iterative process between empirics and theories has led to the article-based structure of this dissertation. Thus, I employ different analytical angles within each paper to present my case material and arguments which are informed through everyday governance perspectives. In the following I will briefly introduce and reflect upon these theories. More details and further reflections can then be found in the dedicated theoretical sections of each paper (see Sections 2.2; 3.2; 4.2; and 5.2).

Practices of assemblage

By identifying six practices of assemblage, namely forging alignments, rendering technical, authorizing knowledge, managing failures, anti-politics, and reassembling Tania Murray Li (2007) has developed a powerful analytical lens to interrogate '*the gap between the will to govern and the refractory processes that make government so difficult*' (ibid. p. 263). Whereas Li developed and applied this analytic in the context of community forest management in Indonesia, she argues that these practices are generic and thus applicable to any assemblage. In this thesis, I will use this analytical approach in the context of Welsh agri-environmental governance to

unpick and demonstrate how a new governance concept becomes mobilised and assembled to serve very different purposes.

Co-production

With the idiom of co-production Sheila Jasanoff (2004) has drawn attention to a number of instruments which are essential for ordering knowledge and societies, namely the making of identities, institutions, discourses and representations. This concept is of immediate relevance to governance in the sense that governance practices shape knowledge and vice versa, and I propose to apply this concept in the context of governing agricultural diffuse pollution. Here, I am particularly interested in the collective mobilisations and reworkings of these four instruments to encourage positive shifts in farmer-environment relations.

Communities of Practice

Jean Lave and Etienne Wenger's (1991) concept of communities of practice is based on people's learning trajectories and posits that effective learning is always mediated and facilitated through situated learning and participation in social groups that share similar interests, concerns or passions. As we will see throughout this thesis a large part of doing governance involves knowledge work and learning about environmentally friendly farming practices. Therefore, this concept offers a very useful angle to document and illustrate how such situated learning can occur within AEG networks. In particular, I will employ this concept in the context of the development of a private food label which has brought like-minded people together through virtual and non-virtual means of engagement and peer-to-peer learning.

Sociotechnical imaginaries

Finally, the concept of sociotechnical imaginaries as defined again by Sheila Jasanoff (2015) draws attention to the collective processes of envisioning and manifesting possible futures due to technological innovations or new scientific insights. This concept offers a particularly interesting lens through which I hope to (a) unpick the visions of digitised AEG from the realities of working, embedding, and responding to such technologies and processes in everyday life, and (b) understand the implications of everyday digitalisations for knowledge and knowing about agri-environmental issues.

By employing and combining these four concepts within the framework of this thesis I do not only hope to provide new insights about the utility of specific AEG instruments, but also interrogate their relational nature and the performativity of AEG systems more broadly. This systemic aspect of AEG is important to point out because in peoples' everyday realities no governance instrument exists or operates independent of one another. Be it farmers, eNGO's, civil servants or any other governance actor, everyone involved lastly faces the multiplicity of AEG in fields, in offices, at meetings or during paperwork, and everyone needs to make sense of it. In other words, there are overall effects of the totality of AEG instruments which are not well understood, and which require more careful research attention.

It is here where I believe the four theoretical concepts can be applied in a more encompassing way. For instance, assemblage theory has much to offer for social scientists and governance practitioners to make better sense of the (dis)connections between governance elements and arrangements at various scales. The concept of co-production can add to this by revealing how certain governance assemblages co-produce knowledge and social-ecological (dis)order by reshaping institutions, identities, discourses, and representations. Social learning theories can help elicit the dialectic and reflexive pathways that are necessary to accommodate various types of knowledge which are affected by governance relations and reconfigurations. And sociotechnical imaginaries expose the discrepancies between AEG instrument design and the everyday challenges of implementation, translation, and practical use.

In this sense this thesis also seeks to speak to earlier and more recent anthropological works concerned with the tensions between the workings of power at the structural level and the forms of deviation and resistance at the level of people's everyday practices (Lowe et al., 1997; e.g. Scott, 1989, 1985; Vollebergh et al., 2021). Of particular relevance in this context is the detailed work by Philip Lowe and colleagues (1997) who have documented the politicisation and subsequent regulation of farm pollution in 1980s Britain through ethnographic fieldwork. What these authors found back then were:

“the roots of [...] competing moralities by examining how farm pollution shifted from being a technical side-effect of efficient food production to an environmental crime. We have done this by tracing the views and actions of those actors most closely involved, following them as they constructed their networks, precariously building their worlds and struggling to convince others

of what is natural and what is unnatural, what is right and what is wrong.”
(Lowe et al., 1997, p. 208)

In many ways this thesis attempts to do something similar. As I will go on to show the moralisation of agriculture and the environment is still very much alive, arguably even more so than a few decades ago. However, the resulting picture is no longer one of two distinguishable moralities within one clearly defined regulatory regime, but one of multiple moralities and regulatory approaches reflecting the convoluted nature of contemporary AEG in the UK.

1.3 Research Questions

As outlined above the purpose of this thesis is to draw a more comprehensive picture of the multiplicity of AEG in the UK, based on a critical and empirically grounded analysis of the promises and hopes that are attached to specific governance instruments. In line with this objective this PhD project takes a step-by-step approach to answering two sets of research questions. The first set of questions is tailored to the specific case studies and subject areas of this thesis which are presented in a series of four separate research papers. These research papers contain the main findings and contributions of this thesis, and they cover the following research questions:

- (1) To what extent do market-oriented instruments like payments for ecosystem services reassemble agri-environmental governance? (see [Chapter 2](#))**
- (2) How does partnership working contribute to the co-production of institutions, discourses, identities, and representations? (see [Chapter 3](#))**
- (3) What roles can communities of practice play in initiating transitions towards more sustainable ruminant livestock farming? (see [Chapter 4](#))**
- (4) How does digitalisation transform the configurations of agri-environmental governance practices and knowledge? (see [Chapter 5](#))**

The second set of questions will allow me to draw the insights from the individual case studies together and reflect upon the broader implications of AEG practices and transitions that are documented within this thesis. These overarching research questions will be addressed in the concluding discussion in [Chapter 6](#) and include the following three questions:

- I. **What does a distinct focus on everyday practices reveal about the mobilisation and social uses of agri-environmental governance instruments?**
- II. **How do agri-environmental governance practices change power relations and knowledge regimes?**
- III. **To what extent are the transitions that we see on the ground indicative for transformational change within the agri-environmental domain?**

Ultimately, the answers to both sets of questions will contribute to a better practical and theoretical understanding of contemporary forms of AEG, including their potential to achieve better governance outcomes.

1.4 Research Design

Within the wider research project, the UK was pre-determined as one of the study sites to conduct doctoral research, and market-based instruments such as PES or biodiversity offsetting were identified in the proposal as potentially interesting directions to follow and explore. This geographic focus and thematic proposition were deliberate choices largely informed by the UK's neoliberal reputation with regards to interpreting and enacting European and national agri-environmental policies (Forney, 2014; see also Adams et al., 2014). In addition, the doctoral research project also foresaw an affiliation with the Sustainable Places Research Institute at Cardiff University to facilitate access to the field and to host the PhD student within a well-established research group focusing on sustainability science which had developed under the leadership of Prof. Terry Marsden.

Inspired by these preconditions and proposals I decided to focus initially on the developments in Wales as the growing popularity of market-based AEG instruments seemed particularly evident here. For example, while PES projects had been piloted across the UK, the Welsh Government had assumed a pioneering role in mainstreaming and institutionalising such market-oriented approaches in overall policy formulation. The revised interpretation of the government's own role from subsidy supplier to buyer of '*environmental goods and services from farmers*' (Wynne-Jones, 2013a, p. 77), following the reform of the country's principal CAP scheme, stood testament to this shift. Thus, a lively academic debate about PES was underway at the start of this research project and I was keen to contribute to it by

further exploring the social realities, meanings and implications of such AEG innovations. To begin with I devised a phased approach to fieldwork and data collection including (i) a preparatory scoping study, (ii) a long-term research stay, and (iii) a post-fieldwork period. In the following, I will explain each phase in more detail including my rationale for selecting the specific AEG case studies which make up the remainder of this thesis.

1.4.1 Phase 1: The scoping study

An initial scoping study for this thesis was carried out between March and May 2016. This first field visit served the purposes of (a) confronting the initial research ideas and plans with the reality on the ground, (b) mapping existing AEG instruments and initiatives, (c) identifying possible entry points for long-term ethnographic research, and (d) building rapport with relevant key actors. For these reasons, I conducted a series of interviews with key informants applying and following the principles of snowball sampling to capture people's social knowledge about AEG (Noy, 2008). That way I was introduced to a broad range of governance actors including academic policy advisors, government officials, farmers, regulators and environmental NGOs, and I also got the chance to visit and see several field and project sites across Mid Wales and South Wales which were recommended to me during these interviews.

What quickly emerged from these first research activities was that PES was indeed on many people's lips and minds but hardly any projects existed that were up and running. Thus, although my interview partners confirmed Welsh Government's sympathetic and supportive role in furthering PES as a new AEG direction, this had not yet translated into concrete actions on the ground; it rather stagnated on the discourse level and feasibility stage of pilot projects. A case in point was the Ecosystem Enterprise Partnership [EEP-Ecobank] in Pembrokeshire, which alongside the Welsh agri-environment scheme Glastir represents the first case of this thesis. The EEP-Ecobank was brought to my attention during an interview with a WG staff member, who emphasised the potential role of such PES initiatives to complement public sector schemes such as Glastir for the delivery of ecosystem services. The EEP-Ecobank project was funded by Welsh Government to develop a potential nutrient trading scheme to mitigate water quality issues in the Milford Haven and Cleddau catchment, which were threatening further commercial development. Managed and led by an eNGO the project *“aim[ed] to address this challenge through*

establishing a collaborative forum of land managers, industry, commerce, government and third sector to find multiple benefits for society, economy, environment and people” (EEP-Ecobank, n.d.). This problem context alongside the preferred choice of solution – i.e. a PES scheme – promised interesting insights into the mobilisation of market-based instruments and the interlacements between the public, the private and the third sector. Consequently, **PES** still constitute the first specific AEG instrument which I have explored as part of this thesis. However, due to the largely theoretical and discursive nature of the subject, I decided to place less emphasis on it and mostly draw on insights from the scoping study and additional document analysis in the research findings (see Chapter 2).

A second – and indeed much more prominent – AEG instrument that emerged during the scoping study was **partnership working**. This *“new way of working”* (EEP-Ecobank, n.d.) was not only evident in the above example, but also dominant in other contexts. For instance, the Wye & Usk Foundation, an environmental charity operating within the Welsh-English border region was involved in various partnerships, including the DEFRA funded Wye Catchment Partnership and the cross-organisational partnership Farm Herefordshire. Both of these partnerships have been concerned with agricultural diffuse pollution which negatively impacts the water quality of the river Wye. Again, this case was recommended to me by a WG staff member due to the complexities around cross-border governance and the partners proactive engagement with the agricultural sector and the wider food industry. Thus, this second instrument of AEG promised very diverse and more importantly very practical insights into the intricacies of *doing governance* on an everyday basis and I therefore decided to conduct long-term ethnographic research on this second case.

1.4.2 Phase 2: The long-term research stay

Building on the above groundwork, the main fieldwork and data collection for this thesis then followed from October 2016 until December 2017. During this second phase I was affiliated with the Wye & Usk Foundation and lived full-time in the Welsh-English border region, more precisely in multiple short-term rentals around the small market town of Hay-on-Wye. My affiliation with the Wye & Usk Foundation was informal and loose. I was generously invited to get to know the work of the organisation’s catchment advisors and their partnership activities with other

organisations. The advice provided to local farmers by a team of five staff members and the partnership work specifically developing around Farm Herefordshire became the main foci of my attention. This was because of the scope and normative nature of these areas of work. These were built on the premise of generating benefits to both farm business and the environment through collaboration (Wye & Usk Foundation, n.d.). Whereas the one-to-one advice between a catchment advisor and a farmer promised first-hand insights into different local farming practices, concrete agri-environmental problems and recommended mitigation measures, the multi-actor partnership Farm Herefordshire promised insights into the relationships and interplays between different governance actors and instruments, thus allowing me to interrogate the multiplicity of AEG in the field and through different angles. Over the course of 15 months, I regularly attended team meetings, partnership meetings, steering group meetings and farm walks, and I was offered the opportunity to shadow the day-to-day work of individual staff members. Through these embedded fieldwork activities, I also got to know further research respondents such as farmers and representatives of other organisations including the partners involved in Farm Herefordshire (for a full list see Table 5 in Section 3.4.1).

During this second, longer-term research stay I inevitably came across other AEG instruments and initiatives which I had not picked up during the initial scoping study. One of these was the Pasture-fed Livestock Association [PFLA], whose **community of practice** constitutes the third case study of AEG presented in this thesis. The PFLA was brought to my attention by a staff member from a Farm Herefordshire partnership organisation, who knew a local farmer that turned out to be one of the founding members of the PFLA. Setup in 2011 as a community interest company and a private food label, the PFLA promotes meat and dairy products from 100 percent pasture-fed livestock production systems. What was most intriguing to me about this farmer-driven example of AEG was that the PFLA presented itself as a solution-oriented initiative in a field that is otherwise largely dominated by problem-based governance approaches. This difference in starting position and the positive stance towards more stringent AEG standards (i.e. going beyond state-led requirements) promised qualitatively different insights as to how members engage with each other and how they, as a community of practice, build alliances with other governance actors. Based on these considerations I decided to closely follow the

developments of the PFLA both online in the PFLA forum and offline during farm walks and events.

1.4.3 Phase 3: The post-fieldwork period

The fourth and final case study only emerged after my return from the field. During overall data analysis and continued desk research on the PFLA, I realised that **digitalisation** had been a common thread across all other cases. Although this topic was certainly more central to the development of the PFLA as a community of shared practice, it was also evident in the Farm Herefordshire partnership and the PES developments in Wales. For example, the design of the Welsh agri-environment scheme Glastir heavily relied on collaborative GIS-based mapping and Farm Herefordshire used YouTube as a platform to spread the message about good land management practices. Moreover, various other examples came to the fore during my conversations with farmers and AEG practitioners, for instance the use of remote sensing to monitor farmers' direct payments or a pilot project to police agricultural diffuse pollution based on satellite imagery and live data conducted by the Environment Agency Cymru [EA]. Taken together, this provided interesting material for critical reflections about digitalisation, especially from the perspective of everyday encounters and its implications for knowing and knowledge creation.



Figure 2: An illustration of the patchwork of AEG instruments and networks explored in this thesis.

Realisation: Author.

In sum, the research design for this PhD project was kept relatively open and flexible from the outset to allow the fieldwork and the respondents to guide the overall research process rather than any strong theories or my own preconceptions. What has come out of this approach is a patchwork of governance networks including different actors, environmental issues, and objectives which coalesce around four distinct but not necessarily exclusive instruments of agri-environmental governance, namely PES, partnership working, communities of practice, and digitalisations (see Figure 2).

1.5 Methodology

At this point it is important to reiterate that I did not merely see and understand my study objects and ethnographic field sites as clearly defined single sites of investigation but indeed as – at times fuzzy and ever-evolving – AEG networks which are determined and shaped by various spatial, temporal, human, and non-human factors and relationships. As such the methodological approach employed in this thesis is very closely aligned with the wider research project (Forney, 2014) and I have taken specific inspiration in what George Marcus (1995) had termed multi-sited ethnographies. Such multi-sited research follows people, things, discourses, stories, life histories or conflicts and is particularly suited for *“emergent object[s] of study whose contours, sites, and relationships are not known beforehand”* (Marcus, 1995, p. 102). Thus, applying this more *“mobile ethnography”* (Marcus, 1995, p. 96) to the tracking of AEG instruments and networks in the UK seemed expedient and involved a combination of qualitative research methods including (i) semi-structured interviews, (ii) participant observation, (iii) document analysis, and (iv) digital ethnography. In the following I will detail each of these data collection methods in turn explaining their importance for obtaining relevant information and data. How these methods and datasets have been combined and used in the analysis of this thesis is then described in further detail in the methodology sections of the respective articles in Chapter 2 to Chapter 5.

1.5.1 Semi-structured interviews

Altogether I have conducted 43 semi-structured interviews over the course of this PhD project. As mentioned in section 1.4 these interviews were critical in identifying the case studies, but also crucial in eliciting my respondents' experiences, viewpoints

and opinions, be that in relation to market-based governance principles, partnership working in the context of agricultural diffuse pollution or to being part of a community of practice built on the premise of grass-fed farming. In either case I have aimed to interview a spectrum of actors involved in the respective AEG networks in order to capture and uncover details, commonalities, nuances and differences in people's answers to my questions. Overall, this resulted in in-depth conversations with academic experts and policy advisors, staff members of environmental NGOs, farmers, farm advisors, representatives from farming associations, regulatory bodies, utilities and finally government officials (for a full list of interviewees see Appendix 1). For each interview I have prepared an interview guide containing primarily open-ended questions. Each interview guide was tailored to the role and function of my interview partners, and to the different subject matters. According to people's availability and preferences most interviews were conducted at their workplace or home except for a few that took place in a public venue (such as a coffee shop) and one which was conducted at my own home. In the case of farmers my interviews were often complemented by a transect walk or drive over the farmyard and adjoining fields providing opportunities for further insights and informal conversations about land use, farming practices and governance issues that I could document through notetaking and photographs.

The average duration of my interviews was about one and a half hours with the shortest interview lasting 45 minutes and the longest interview taking almost three hours. Most interviews were tape recorded with the permission of the interviewee and later transcribed verbatim by myself. However, there were a few instances in which such formal interview situations were either unpractical or felt misplaced and in these cases I decided not to audio record the conversation but instead to take detailed notes during or immediately after the meeting (e.g. during a walking interview with an agronomist or a day-out with a farmer). To protect the identity of my interview partners I have chosen pseudonyms or generic descriptors in the analysis. Providing this level of anonymity was advisable not only because of the sensitivities around some of the topics and information discussed during the interviews, but also out of respect to the interviewees who were part of tight-knit networks in which most people knew each other.

Overall, the semi-structured interviews have helped me to construct a clearer picture for each of the studied AEG instruments and networks in terms of their

history, the key actors involved, their roles and functions, as well as the successes and challenges that people have come to associate with them. Most conversations felt very natural and open and in many cases, they have allowed me to interrogate further issues and questions that emerged over the course of my fieldwork. In this sense, the interviews also served as a tool to verify some of my field observations or bits and pieces of information that I had picked up informally, through documents or otherwise.

1.5.2 Participant observation

Alongside semi-structured interviews, participant observation produced important insights especially in relation to everyday practices of AEG. This method allowed me to collect both explicit and tacit information (Musante and DeWalt, 2010), and thus it contributed to a much deeper understanding about the ins and outs of doing governance in farmers' fields and kitchens, in organisations' back offices, at meeting tables, and at public events. As mentioned earlier, I was able to make observations through participating in a range of work activities first with the Wye & Usk Foundation and later on also by attending meetings of the PFLA. Altogether, I made observations on more than 40 different occasions which can be categorised as follows: (i) job shadowing, (ii) partnership meetings, (iii) farm walks, and (iv) other events (see also Figure 3).



Figure 3: The number and types of participant observations undertaken during fieldwork.

Realisation: Author.

1.5.2.1 Job shadowing

Job shadowing provided opportunities to better understand the work of catchment advisors and their relationships with farmers and other organisations. It either involved me joining individual staff members on days out when they were conducting farm visits or attending team meetings on office days. Both activities were helpful to glean first-hand insights into typical workdays, the approach taken to provide advice to farmers, the kind of knowledge that people held, used and discussed, the signposting that happened between different organisations, and so on. Such activities also provided plenty of opportunities for informal discussions and to engage in chit chat about work-related and personal matters of concern. In one way or another all of these activities helped me to move forwards in the research process, be that through the new contacts that I was able to make, the knowledge that I gained which allowed me to ask new questions, prompts and probes, or the connections between various actors and governance instruments that hereby became much clearer.

1.5.2.2 Partnership meetings

Quarterly meetings of the Wye Catchment Partnership and of Farm Herefordshire offered me possibilities to observe multi-actor partnership working in actual practice. I was invited to attend these meetings as a guest researcher and I was allowed to make observations, take notes and engage in conversation with partners. While attending was useful and productive in both cases, the observations I made were particularly insightful in the latter case. The steering group meetings of Farm Herefordshire did not follow a pre-defined workshop format (as was the case at Wye Catchment Partnership meetings) but included open discussions about matters arising for the group and planning of upcoming events and activities. The discussions therefore revealed much of the politics and social dynamics involved in partnership working including the areas of consensus and friction, the doers and blockers, or the ambitions and constraints of the initiative.

1.5.2.3 Farm walks

Attending a number of farm walks gave me opportunities to observe how certain AEG issues and farming practices are thematised and discussed between farmers and between wider agricultural stakeholders. These farm walks were either organised by

Farm Herefordshire as part of their outreach and demonstration work or by the PFLA as a way to encourage knowledge exchange and learning between members. Although I did not formally compare the farm walks in the analysis their format differed considerably, reflecting the two organisations' different ways of working, goals, and interpretation of their own role in knowledge facilitation. Those organised by Farm Herefordshire usually focused on one of their identified good land management practices promoted through the partnership and host farmers were actively supported by professional farm advisers of one or two Farm Herefordshire partner organisations. As such these farm walks were more formal, structured and facilitated. PFLA farm walks on the other hand did not include a facilitator as such. Although a PFLA representative was usually present, the farm walks were structured and run by the individual host farmers alone. These farm walks focused more on the individual approach to pasture-fed livestock farming and included the host's reflections about personal experiences, trial and error and the many lessons learnt over time. Conversations and discussions consequently flowed more naturally, and they flowed in both ways – from host to participants and from participants to host, yielding useful input and feedback for both sides.

1.5.2.4 Other events

Lastly, I was able to make additional observations by attending a variety of events and meetings that were either directly associated with or indirectly related to one of the studied AEG networks. This included for example the Annual General Meeting of the PFLA, the annual forum of Herefordshire Meadows (another AEG initiative in Herefordshire), rural business advice days and policy information events which were organised for farmers, a public meeting of an environmental pressure group to raise awareness about the negative impacts of intensive poultry farming, as well as various practitioner-oriented conferences and workshops on agricultural policies, sustainable agriculture, and soil health. What was most remarkable about these events was that the different AEG networks sometimes came together here. For instance, the Herefordshire Meadows events had been promoted through Farm Herefordshire and it included two farmer speakers from the PFLA. Similarly, a rural business advice day attended by several Farm Herefordshire partner organisations also included a public presentation from a PFLA farmer. This indicated the overlaps between different AEG networks which began to inform each other at such events.

1.5.3 Document analysis

Throughout my fieldwork I also examined and interpreted a wide range of documents related to the respective AEG networks. This included different types of documents and different mediums used to store and convey information (see Table 1). Most of these documents were obtained and selected interactively, i.e. by following suggestions, hints and remarks made during my interviews and observations. The document analysis itself served specific purposes (Bowen, 2009). First, it allowed me to familiarize myself with the context, the previous history, the formulated objectives, the intended ways of working and the reported achievements of the individual cases and organisations involved. Thereby, I gained a deeper understanding of the subject matter and of the overall empirical body of knowledge developing over the course of my fieldwork. In this sense, document analysis was as critical as the other methods for uncovering relevant empirical and theoretical patterns and themes in my grounded research approach.

Table 1: Types of documents analysed in this thesis.

Printed documents	Electronic documents
• Agendas • Application forms • Brochures • Event fliers • Farm reports • Leaflets • List of attendees • Manuals • Maps • Minutes of meetings • Proposals • Reports	• E-mails • Newsletters • Pictures • PowerPoint presentations • Social media posts (Twitter, Facebook) • Websites • Videos (published on YouTube and other websites)

Second, many of the documents that I have analysed included important cues with regards to the construction of social facts and the social organisation of internal and external information flows and exchanges. Thus, they directly constituted relevant empirical material to document the social uses and implications of the various AEG instruments under investigation. For example, this was particularly evident in the case of the YouTube videos produced by Farm Herefordshire, which have been used to broadcast the partners' understanding and meaning of "good" land management practices. But documents were also essential for re-tracing the

historic development of the PFLA, and to illustrate both PES and digitalisation developments.

Lastly, document analysis was used specifically for triangulating methods and data. It thus served as a means to strengthen the overall credibility of and confidence in my research results by reducing potential biases and overreliance on any single research method or dataset.

1.5.4 Digital ethnography

Finally, in the case of the PFLA I decided to supplement my methodological repertoire with digital ethnography (Murthy, 2008). Digital ethnography or '*netnography*' (Kozinets, 2002, p. 61) is particularly useful to study the interactions within online communities such as the PFLA's Google Group. In order to access this resource, I joined the organisation as a paying member (more details about this approach and my rationale can be found in Section 4.3). At the time of me joining in May 2017 the forum contained less than 2000 discussion threads, that means topics or questions that had been raised by individual members which could then be replied to, or commented on by other members. As of September 2022, this number has grown to more than 4400 discussion threads.

As in the case of document analysis, digital ethnography for me involved '*skimming (superficial examination), reading (thorough examination), and interpretation*' (Bowen, 2009, p. 32) of conversations and information flows on a regular basis. To manage this, I set my subscription settings to receiving e-mail digests of conversations rather than individual posts. This allowed me to keep track of all conversations but only to explore those further that sounded interesting to me based on the topic or flurry of activity between members. In addition to this I also searched for frequently raised topics (see Figure 4) and specific topic areas that came up during other fieldwork activities. On one hand this served the purpose of familiarising myself with the breadth of knowledge, experiences, concerns and issues shared and discussed within the forum and on the other hand to learn more about technical aspects of pasture-fed farming (e.g. mob grazing).



Figure 4: A word cloud showing the most frequently mentioned words within titles of discussion threads within the PFLA Google Group.

Realisation: Author.

Such online research activities were absolutely critical for understanding, capturing and illustrating the development, interactions and quality of exchange within this particular CoP, which went far beyond offline meetings or more traditional means of communication. For many PFLA members the online forum had become part of their everyday practice and everyday life, and this AEG culture could therefore only be appreciated fully by following the virtual interactions personally and over a long period of time.

1.6 Positionality

My methodological choices, the length of my fieldwork, my conceptual “predispositions”, and previous (lack of) understanding of UK AEG necessitate some reflections and disclosures about myself and my positionality throughout this research project. Demonstrating such ‘*position sensibility*’, as Mark Fathi Massoud (2022, p. 85) recently called it, is essential for any scholar in order to account for the motivations, privileges and vulnerabilities that can affect qualitative research enquiries in positive and negatives ways. So, how did it happen that I, a German-born male, now in his late thirties, without a “proper” agricultural or anthropological

background (at least in the traditional sense), got enrolled at a French-speaking university in Switzerland to study – of all things – AEG in the United Kingdom? What were my vested interests, if any? What kind of privileges, challenges and vulnerabilities did I experience in the field? And how have my own experiences, world views and learning processes influenced and informed the research? I will attend to these questions not to justify myself or to seek more credibility, but to put the readers of this thesis in a position to better understand who the author is and where he was departing from. With this I hope to provide more clarity about my way of doing ethnographic research and my reasoning for interpreting the data in the way that I have done in the findings of this thesis.

My interests in agri-environmental governance and more broadly in agri-food studies has developed over a longer period of time and is, hence, predating this thesis. Whilst my childhood and school years in a middle-class family and a medium-sized city in Southern Germany were vastly detached from agriculture, food production and to some degree also from nature, my interest in these topics was gradually nurtured at university level. My undergraduate degree in Governance and Public Policy at University of Passau in rural Bavaria introduced me to this broad subject area as well as to various social science disciplines that try to make sense of it. During this time, I developed a particular interest in institutional, environmental, and development economics and I completed my degree with a thesis on water resource management in Egypt. This first phase of my studies was accompanied by part-time jobs and a series of internships in Bavarian local politics, EU lobbying, and development aid. What followed after graduation was a first full-time stint at a consulting company active within the water and environment sectors of developing countries. A strong desire to find more complete answers to questions that I had about the role of agriculture and food in development work eventually led me to return to university education by taking up a master's degree in Agricultural Development at University of Copenhagen. The interdisciplinary nature of this degree afforded me with flexibility and freedom to explore a wide range of topics including rural livelihoods and natural resource management, organic agriculture and alternative food networks, or horticultural production and supermarket-led development in Indonesia, with the latter forming the basis of my master thesis (Vetter et al., 2019). Therefore, my time in Denmark from 2011-2015 allowed me to critically engage with a wide range of topics in agrifood studies as well as with mixed

methods research including ethnography. This very positive and inspiring study experience lastly encouraged me to search and apply for PhD opportunities. At this point in my life my main interest had also shifted away from development work and developing countries towards understanding more clearly how positive change in the agri-environment can be created where I felt at home, namely within the EU. Thus, somewhat ironically the main reason which brought me to the UK, and which led me to take up this PhD position, was my interest in gaining expertise in agri-environmental governance within an EU context. With the other field site of the main research project being New Zealand (see again Figure 1 in Section 1.2), the UK was the only logic choice, but with the Brexit referendum in June 2016 my plan has not exactly panned out as I had expected (or hoped), and instead this event provided an additional level of complexity and a degree of change to my chosen field site and research topic. Upon my start at University of Neuchâtel, during the preparatory phase of this PhD project, I also decided to do some volunteer work (1 day per week) on an organic farm on the outskirts of town as a way to compensate for my lack of physical activity and for my lack of understanding what it really means to do agriculture in this day and age and within one of the most affluent societies in Europe.

The reason why I am mentioning these autobiographical pieces of information is that they draw a picture of a social science generalist rather than a fully trained anthropologist; a person that is interested in different disciplines, theories and methods which seek to further understanding about fair and sustainable social and ecological development; a person with some relevant deskwork and research experiences, but not someone with an awful lot of hands-on experience or exposure to primary production and environmental management; someone who is used to live in and navigate different cultural and geographical settings but with no previous experience in the UK¹; and a person who has always been a firm believer that well-planned and well-designed governance and public policy instruments can make positive impacts on society and the environment.

Importantly, these self-identifications alongside some of my underlying personality traits (e.g. curious, introvert, considerate, modest) have created a positionality which generated specific privileges. To these belonged my role as a foreign researcher who was generally perceived to be non-threatening, listening and

¹ Except, of course, for the obligatory school trip to London during teenage years.

trustworthy to share sometimes very personal experiences and opinions with. It included my ability to ask almost any kind of question no matter how basic, silly or sensitive it may have seemed to a native researcher, as I was usually forgiven my ignorance due to being an outsider who was not socialised within the UK. It also included the privilege to view my field with a fresh pair of eyes due to being relatively unfamiliar with UK AEG but nevertheless able to make comparisons to what were more familiar national contexts to me (e.g. Germany, Denmark, Switzerland). This allowed me to sharpen and contrast my own understanding about UK AEG (and public and social life more generally) as well as to productively inform interview situations when such comparisons and anecdotes seemed appropriate and helpful. Another privilege which needs mentioning here were the generous funding conditions of my Swiss PhD position relative to other countries, which allowed me to conduct long-term fieldwork to immerse myself within the research context. This has certainly helped me obtain a much more emic perspective of the various AEG instruments that I have explored, which would not have been possible otherwise.

Apart from such privileges I also experienced some challenges and vulnerabilities in connection with my positionality. To these I would count again my role as a foreign researcher and my initial unfamiliarity with the ins and outs of UK AEG. It required from me to engage in a steep learning curve to understand and converse in similar governance and farmer speak as my research participants. English was not the problem here – except for the odd occasion when I did not catch specific words or phrases expressed in local dialects – but the abbreviations, terminologies, technicalities, and processes used and referred to which were new to me. The broad scope or easily perceived '*scope(lessness)*' (Emery, 2010, p. 2) of my fieldwork also presented a significant challenge. It often put me in the uncomfortable situation to explain clearly and in a few words what I was trying to find out and what benefits would derive from this research. Whilst these were very valid questions and reasonable expectations, the problem was that the answers to these questions were not always clear to me. In the beginning I was struggling to make sense of my '*emergent object[s] of study*' and once the '*contours, sites, and relationships*' (Marcus, 1995, p. 102) became clearer I still felt uneasy to claim that any tangible or valuable insights might come out of my research – after all I expected my respondents to be well aware about their own everyday practices and at least also about some of the governance transitions they were part of. In hindsight, I should

perhaps have been more okay myself with my grounded approach to fieldwork and hence more open about the ensuing insecurities and vulnerabilities – but of course this is easier said than done in a fieldwork or interview situation which not only involves people performing specific roles but also adhering to deeply engrained expectations and patterns about expert/academic knowledge production. Another vulnerability that I experienced was directly related to that and to my long-term presence in the field. It involved the management of expectations and the risks of getting personally invested in the objects of my studies. In order to cope with this, I did not commit to any predefined or tailored research outputs for my research participants, and I distanced myself from particularistic interests in fieldwork situations by emphasising my role and presence as an impartial observer and independent researcher.

Thus overall, there is a lot of myself in this thesis including my strengths and weaknesses both as a person and a researcher. These have influenced the situated research in which I got engaged, including the decisions that I made about selecting case studies, interview partners, events to attend, etc. As such there is an undeniable element of subjectivity in the way I conducted this research as it was physically and mentally impossible to completely dissociate myself as a person from the ethnographic observer that I also was in the field. Whilst this poses interesting questions about the myths of absolute neutrality, objectivity, and replicability, it is also clear that the situations that I experienced were unique and are as such not repeatable. What I tried to do, though, to ensure as much neutrality and objectivity as possible, was to give my research protagonists room for their own words and actions in both the way I collected data and the way I presented that data in my research papers. I do hope that I did them justice and that I represent an accurate account of their situated experiences, too.

1.7 Contributions and limitations

Overall, this thesis makes at least three original contributions to the literature. First, it provides an emic perspective and everyday account of AEG practices based on research findings which I was able to gather *with* rather than *on* some of the actors involved in AEG. Facilitated by my ethnographic approach this has led to new insights about the social dynamics and real-life aspects of governing both complex environmental issues and desired change within the agricultural sector of the UK.

Social scientific studies including anthropological and ethnographic work remain underrepresented within agri-environmental policy making even though they can contribute to a grounded understanding of governance interventions and therefore have much to offer in regard to devising better governance systems. Second, the thesis forges productive links between a number of theoretical concepts which thus far have not received the level of consideration and application that they deserve within the context of AEG and wider agrifood studies, most notably the concepts of assemblage, co-production, social (un)learning and sociotechnical imaginaries. Their application in this thesis produced useful and novel insights, for example about the (inter)relationships between different AEG instruments, actors and practices; the (re)construction and/or reinforcement of social and ecological order via changes in discourses, institutions, identities and representations; the dialectic and reflexive relationships between people's previously and newly acquired knowledges, and the frictions between the imagined and the everyday. Third, as a whole this article-based thesis provides an empirical snapshot of the AEG landscape in the UK which is characterised by multiplicity, creativity and voluntary ethos, as much as by complexity, fragmentation and flaccidity, all of which are aspects that are not yet adequately addressed in AEG research and practice. As such this thesis reinforces other people's calls for more refined AEG analysis, by shifting the focus on actual AEG practices rather than conceptual binaries and dichotomies that either no longer hold (in a strict sense) or that are unhelpful in sharpening our understanding as to how we can possibly move forwards in an era of biodiversity and climate emergencies.

Besides these contributions there are a few limitations and caveats, however, which need to be acknowledged and explained. First, the case studies in this thesis are based on the lived experiences of my research respondents and indeed of my own experiences as a participant observer, and hence the findings are only indicative for the AEG developments described in this thesis. Therefore, the following chapters should be read with this limitation in mind and the indicative results should be treated as such. Second, there are of course many other AEG instruments and networks which I could have explore instead or in addition. Some might have produced similar insights and reflections whereas others, I am sure, would have taken this thesis into different empirical and theoretical terrain. However, it never was the ambition of this PhD project to provide a complete or wholly representative picture of the diverse

landscape of AEG in the UK. My case selections were the result of what I have found in the field and what I was able to study within the realms of this project. While I believe that similar in-depth case studies in other regional contexts of the UK and in other national contexts would be helpful to complete and compare the picture, other research approaches including quantitative studies are needed as well to establish more general conclusions.

1.8 Outline

The remainder of this thesis is structured as follows: Part II contains the findings of this thesis, presented in the form of research papers. It will commence with *Chapter 2 – Assembling Payments for Ecosystem Services in Wales*. This first paper was co-authored jointly with Dr. Sophie Wynne-Jones from Bangor University and first published in Forney, Rosin, & Campbell (2018a). *Agri-Environmental Governance as an Assemblage: Multiplicity, Power, and Transformation*. London: Routledge (Earthscan). My contributions to this paper were twofold: It included some of my empirical material about the Welsh agri-environment scheme Glastir and the Pembrokeshire-based initiative Ecosystem Enterprise Partnership – Ecobank, and I provided critical reflections inspired by Tanya Murray Li's (2007) practices of assemblage, which we have used in this paper as a conceptual framework to analyse and interpret PES-inspired transformations in Welsh agri-environmental governance.

Chapter 3 – Co-producing better land management? An ethnographic study of partnership working in the context of agricultural diffuse pollution then goes on to present the case study results of Farm Herefordshire. This single-authored article was published in the *Review of Agricultural, Food and Environmental Studies* and engages critically with the concept, phenomenon, and practices of governing complex agri-environmental problems through multi-actor partnerships. All contributions to this paper were made by myself and thus any mistakes and limitations remain my own.

The same caveat also applies to *Chapter 4 – Social (un-)learning and the legitimization of marginalized knowledge: How a new community of practice tries to 'kick the grain habit' in ruminant livestock farming*. This second single-authored article, published in the *Journal of Rural Studies*, presents the results of my work on the Pasture-fed Livestock Association. The paper draws on social learning theories developed by Jean Lave and Etienne Wenger (1991) and is particularly interested in

how a private food label can also act as a new community of practice stimulating peer-to-peer learning through virtual and non-virtual means of engagement.

The last paper in this section is presented in *Chapter 5 – When sociotechnical imaginaries meet everyday practice: Digitalisation and the transformation of agri-environmental governance practices and knowledge*. This paper manuscript draws on the experiences of some of my research participants with digitalisation processes in various contexts. My contributions to this last paper included the conceptualisation and writing of the first full draft which is included in this final version of the thesis. Incorporating the feedback, ideas and revisions of my supervisor and co-author Jérémie Forney, as well as the submission of this manuscript to a suitable journal, will follow after the thesis defense in June 2023.

Finally, Part III contains the concluding discussion of this thesis. By returning to the overall research questions set out in this introduction, Chapter 6 presents a number of transversal conclusions which can be drawn from this research project.

Part II: Findings

Chapter 2 – Assembling payments for ecosystem services in Wales

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Abstract: This chapter uses an assemblage approach to evaluate the development of ‘payments for ecosystem services’ in Wales, via transformations of agri-environmental governance over the last ten years. Whilst the adoption of PES has led to a shift in governance style and State responsibilities that echoes broader trends in neoliberalisation, we reject readings of hybrid neoliberalism following, instead, Tanya Murray Li’s (2007) practices of assemblage to unpick the complex institutional arrangements emerging. Using an assemblage approach enables us to assess how different actors are mobilising and aligning around the PES approach to advance their own agendas. Following the practices used to authorise and render their concerns technical then shows us how and why some actors are being marginalised in this process, particularly as failures emerge and re-assembling is undertaken. Finally, we offer insights on how the State continues to maintain power whilst entering into new relations with other actors, advancing a more experimental mode of governance. The empirical material is based on three qualitative case studies, including pan- Wales agri-environment schemes as well as the ‘Pumlumon Project’ in Mid-Wales and the ‘Ecosystem Enterprise Partnership - Ecobank’ in South-Wales.

Key words: Payments for ecosystem services, assemblage, agri-environmental governance, power, Wales

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2.1 Introduction

‘Payments for Ecosystem Services’ [PES] has become an increasingly dominant globalised policy narrative to describe a range of initiatives aiming to extend the principles of market governance to the management of ecosystem processes and functions (Gómez-Baggethun et al., 2010; Sullivan, 2013). Despite blueprints setting out the desirability of ‘pure’ market transactions (Engel et al., 2008) PES developments exhibit differing degrees of commodification and marketization as they have been adapted to tackle a broad suite of environmental challenges (Muradian et al., 2013), whilst also accommodating diverse socioeconomic and political issues pertinent to varying contexts (Roth and Dressler, 2012). Consequently, critical social scientists identifying such developments as indicative of neoliberalisation, have begun to articulate such mutations and accommodations as forms of ‘hybrid neoliberalism’ (Higgins et al., 2014b). However, the coherence and relevance of this frame has increasingly been questioned (Hodge and Adams, 2012; Wolf, 2014). In this chapter we evaluate PES developments in Wales (UK) over the last ten years to offer an alternate, assemblage-inspired reading.

Here, agri-environmental governance has provided a forum within which PES has been explored as a new policy instrument. This has involved a shift in the rhetoric and rationale of governance, changing the framing of State-led transactions and leading to calls for non-State finances to supplement and expand previous funding mechanisms (Davies, 2013a). This has led to the involvement of a more diverse range of stakeholders including NGO’s, development agencies, utilities, industry, and individual farm businesses to provide a matrix of ‘pan-Wales’ and place specific governance arrangements operating alongside one another.

These shifts in discourse and preferred mechanisms of finance have also been accompanied by a change in the framing of farmers and the expectations placed upon them. Availability of public monies have been withdrawn and refined so that farmers have to be more pro-active in the pursuit of payments, and an expectation of clearer deliverables has accompanied this (Wynne-Jones, 2014, 2013b). These changes demonstrate a shift in governing style, with government no longer wanting to be seen to impose and dictate, but rather to incentivise desired behaviours and outcomes. This new relationship is intended to move towards market transactions, where the farmer delivers (ecosystem) goods and services that the consumer will then wish to buy (WG, 2009). The State is reframed as that consumer,

on behalf of its citizens, but equally an array of additional actors (as noted above) have also stepped forward to develop new arrangements (WG, 2016a).

Nevertheless, developments continue to fall short of full marketization (c.f. Boisvert et al., 2013; Potter and Wolf, 2014). In earlier evaluations (Wynne-Jones, 2013b, 2012), this has prompted recourse to a frame of hybrid neoliberalism and readings of neoliberal governmentality to understand the otherwise apparently contradictory moves of the State and the new subjectivities nurtured amongst governed populations. This chapter takes a different – assemblage inspired – approach responding to recent critiques of hybridity and neoliberalism as analytical categories, which will be outlined in the next section. We also seek to respond to three key distinctions emerging in our case material that set it apart from earlier discussions.

Firstly, the actors and institutions now involved in Welsh agri-environmental reforms are multiple and come together in increasingly complex forms which may mimic and learn from other arrangements but appear as context – and often place – specific groupings. This is not simply a balancing of public and private, state and market, but much more multifaceted and diffuse (see also Hodge and Adams, 2012); raising questions around the levels of control that the State continues to assert and the appropriate scale of governance.

Secondly, the label of PES is being applied here to an array of notably different projects, serving diverse ends and operating through a range of governance mechanisms; meaning that multiple iterations and incarnations of ‘PES’ exist alongside each other (see also Potter and Wolf, 2014). Sometimes these are operating at different spatial scales (national or place specific), but often act concurrently within the same territorial units (e.g. a catchment, region or farm).

Thirdly, the coherence and ultimate trajectory of what we are witnessing needs to be considered carefully in order to capture the reactive and contingent nature of decision making throughout. Thinking in terms of policy mobility (McCann and Ward, 2012; Prince, 2017), to assess the current form of PES in Wales without attention to the continuing negotiations, amendments and unexpected opportunities arising, would be to erase critical political moments. Imagining PES development as having followed a linear and singular trajectory would be an unhelpful simplification. As Nicholas Rose observes:

“Programmes and technologies of government...are assemblages which may have a rationality, but this is not one of a coherence of origin or singular essence... To analyse...is not to seek for a hidden unity beyond this complex diversity... It is to reveal the historicity and the contingency of the truths that have come to define the limits of our contemporary ways of understanding...”

(Rose, 1999, pp. 276–277)

This chapter follows Rose’s prompt, to read the emergence of PES in Wales as a form of assemblage in order to unravel the complex networks, reconfigurations and antagonisms involved.

2.2 Assembling Governance

Understanding policy transfer as processes of assemblage allows us to break with totalizing narratives in which ‘neoliberalism’ is universalised and always dominant (McCann and Ward, 2012). Assemblage can be understood as both a descriptor of form and the processes that bring such arrangements into being. An assemblage reading allows us to better understand the interplays and coming together of diverse priorities and agencies occurring in place, along with the over-determining and emergent nature of life (Prince, 2017). Ontologically, Anderson et al. (2012, p. 175) argue that assemblage helps us to undo and rethink the categorisation of neoliberalism by attending to *“the processes of composition that produce durable orderings and of the ontic indeterminacy of what might ordinarily be thought of as totalizing practices and processes.”*

Whilst assemblage thinking has been popularised in other areas of policy mobility (see Anderson et al., 2012; McCann and Ward, 2012; Prince, 2017) the literature on agri-environmental governance and PES has remained somewhat constrained by meta-narratives of neoliberalism, in which variation is understood as forms of hybridization (Higgins et al., 2014b). The PES literature in particular has focused-in on the extent to which schemes adhere to market blueprints as a desired endpoint, although questions regarding the utility of such imaginaries are now being asked given the continued failure to achieve ‘pure’ markets (McElwee et al., 2014; Muradian et al., 2013).

Notions of institutional blending (Hodge and Adams, 2012) have been suggested to replace the imprecision of ‘hybridization’. Specifically, Hodge and Adams argue that:

“...projects blur the boundaries between state, private owners and civil society. This blurring is increasingly characteristic of some forms of neoliberalisation. Yet that concept is too broad and crude, to capture the subtleties of the changes taking place.”

(2012, p. 476)

“[...there has been] a failure to unpick the different and often contradictory processes that are bundled up....”

(ibid, p. 474)

Their efforts to set out a different imaginary are particularly informed by the UK context, where NGO's have taken an increasingly prominent role in new modalities of rural governance. This has happened in conjunction with a broader diversification of stakeholders that resonates with the scenarios we have encountered in Wales. Their conception of institutional blending seeks to offer finer purchase on a *“complex mix of formal legal provisions, separation of property rights, design and provision of external incentives and forms of partnerships between actors”* (ibid, p. 477), whilst avoiding automatic recourse to the normative inference of neoliberal analytics. It also seeks to describe *“solutions worked out on the ground by a wider range of social actors”* (ibid) which connects to our concern with the trajectory and intentionality of policy developments.

Unpicking the ways in which PES has been made to work by crafting together different institutional forms and tools, is a theme similarly tackled by Higgins et al. (2014a) as a means to advance readings of hybridity (see also Fletcher and Breitling, 2012; McElwee et al., 2014; McElwee, 2012; Potter and Wolf, 2014). Higgins et al. (2014a) contend that the identification of hybridity is not enough if we don't understand why the different components and adaptations are necessary. Their account of PES development in Queensland Australia offers an assessment of how different governance approaches have succeeded one another and the failures tackled in each re-iteration, showing how different forms and tools meet specific stakeholder needs.

Yet their reading also leaves unresolved questions about the levels of rationality and pre-intention that can be ascribed to the actors concerned, which a more continuous form of ethnographic research engagement could better address. Their narrative, although highly detailed, is somewhat sanitised of the struggle and unexpected emergences that are revealed in assemblage readings of policy transitions. Similarly, we contend that Hodge and Adams' (2012) analysis could be

enriched through application of an assemblage lens by enabling a clearer appreciation of how the different institutional forms inter-relate as part of a broader process of negotiation and experimentation to draw out connecting (f)actors, and temporal references, in the production and realignment of the different projects. Overall, we argue that PES scholarship would be enriched by a more explicit focus on the policy *mobilities* involved to augment analyses of the forms taken.

The assemblage literature offers key tools to advance these aspirations, but it is diverse - inspired by theorists including Deleuze, Delanda, Latour and Foucault (Woods et al., 2015). Clarity in the terms of reference and epistemological parameters employed is therefore important. For our analysis we draw on the work of Tanya Murray Li (2007), who advances a Foucauldian-inspired approach, to uncover and explore the processes and rationalities of State-craft. Rather than addressing the *resultant* governance formation as a settled or complete entity, Li directs us towards their contingency as “*elements are drawn together at a particular conjuncture only to disperse or realign...*” (2007, p. 265) and “*the hard work required to draw heterogeneous elements together*” (ibid). As such, we are encouraged to attend to the diversity of agendas and priorities that could be written-out if we only consider specific moments of stabilisation within the ongoing processes of policy production and reformation. To apply this reading, Li sets out six practices of assemblage (see Table 2):

Table 2: Practices of assemblage

Forging alignments	Building alliances and compromises between different governance actors
<i>Rendering technical</i>	Devising mechanisms through which complex issues can be simplified to work within a universal schema, enabling the measurement of outcomes
<i>Authorising knowledge</i>	Endorsing a specific, often technical and elite, body of knowledge that is conducive to the assemblage
<i>Managing failures</i>	Masking fundamental weaknesses through new adjustments, devising compromises
<i>Anti-politics</i>	De-limiting debate about how and what to govern and the effects of particular arrangements
<i>Reassembling</i>	Reworking failures; deploying existing discourses to new ends

Source: paraphrased from Murray Li (2007, p. 265).

Whilst not intended as a strict method of ordering and explanation, these practises offer a useful heuristic to trace and position the messy policy emergences we are seeking to make sense of. It is an approach that lends itself to the analysis of micro-processes and the diversity of influences, as well as the unexpected and incoherent outcomes that are subsequently smoothed-over. It allows us to see politics and governing as fundamentally disordered and fraught; an ongoing challenge that is too often streamlined in official and academic narratives to produce neat linear trajectories of change and control (Murray Li, 2007; Rose, 1999). Applying an assemblage reading is, therefore, a means to better understand why and how things change in a particular way; to appreciate the sheer difficulty of arriving at constructive results and the persistent need to re-assemble, but also to attend to the frictions of different contexts, noting what persists under new (dis)guise. As such, we use Murray Li's (2007) methods as a means to understand how multiple – and not necessarily coherent – incarnations of PES have been produced to work alongside each other and how this label continues to be asserted as a form of legitimation to authorise very different assemblages and the aspirations associated.

2.3 Case analysis

To demonstrate the processes involved in assembling PES in Wales, we follow a broadly historical sequence in the narrative presented, although transformations in pan-Wales agri-environment schemes are discussed first before moving to consider two place-based initiatives. In reality, these arenas for PES development operated in parallel and have now coalesced somewhat. Discussions of place-based initiatives are limited to two cases, the 'Pumlumon Project' in Mid-Wales and the 'Ecosystem Enterprise Partnership - Ecobank' Project in Pembrokeshire, South-Wales (see Figure 5).

The discussion here is informed by formal interviews, ethnography and documentary research undertaken over the last ten years. This has included interviews and observations with government staff and actors associated with the projects outlined, along with analysis of policy and project documentation, government scheme application and operational instructions, Ministerial statements and press material.



Figure 5: Map of Wales showing the two project locations.

Source: adapted from Wikimedia Commons, not to scale.

2.4 Transforming Agri-Environment Schemes

Within Wales, interest in ‘payments for ecosystem services’ first appeared in 2008 as part of reforms to agri-environmental schemes operating under the Common Agricultural Policy [CAP]. Adoption of the PES discourse was in response to critiques about the effectiveness of pre-existing schemes and questions surrounding the

continued legitimacy of farm supports more broadly. This was particularly from environmental lobby groups who demanded clearer public benefits from payments to farmers, but also from civil servants concerned about the degree of dependency within the farming sector upon decreasing CAP payments (WG 1² interview April 2016). Simultaneously, the Welsh Government [WG] sought to address public and European legislative pressures for widening environmental responsibilities, including concerns around climate and water governance (WG, 2009). At this time, the language of ‘ecosystem services’ was becoming popularised, following the 2005 Millennium Ecosystem Assessment and the potential of a more ‘results based’ model of agri-environmental payments was being explored (Burton and Schwarz, 2013).

Despite a step-change in rationale, the resulting scheme, known as ‘*Glastir*’, was not markedly different from its predecessors. Whilst the language had changed to authorise the terminology of ‘ecosystem services’, the broad mechanisms and basis of payments had not (Wynne-Jones, 2013b). Rather than a radical rupture from previous approaches, a more gradual process of *forging alignments* between diverging interest groups was evident. Opposing pressures for substantive reform, Ministerial favouring of farming interests ensured that an entry-level scheme was available to a broad cross-section of farmers, countering concerns that targeting environmental outcomes would be done at the expense of maintaining socio-economic benefits across the sector (WG 2 pers. comm. May 2016). Traversing the growing divide between farming and environmental interests, support for reframing farmers as more entrepreneurial and self-regulating subjects was aligned with desires for increased accountability in public spending. However, not all aspects of this compromise suited the different actors, with farming representatives wanting more autonomy but expressing concerns about the risks of more variable and contingent payment methods (Farmers’ Union interview October 2010). Environmentalists and civil servants, by contrast, had previously sought to intervene in farmers’ control over land management rather than granting more self-direction, but they did want to make environmental payments more conditional.

These areas of overlap formed a space for *alignment* through which reforms could proceed. In the very act of constructing new terms of debate around the delivery of ecosystem services, diverse conflicts were being *rendered technical* and

² WG1 and 2 refer to interviews with civil servants with responsibilities for agri-environment governance and PES development (job titles changed over time).

disassociated with previous argumentation. Another key method for rationalising diverging opinions was through the production of targeting maps, where different priorities could be accounted for in GIS layers. These were produced through a public consultation resulting in 130 maps, which were subsequently refined to provide the data and strategy for an ‘advanced’ level scheme superseding the earlier ‘entry level’ model.³ Despite the process of open consultation, critics contend that the maps authorize particular sets of knowledge while inevitably excluding others who do not have the capacity to relay information in the necessary format (Farmer 1 interview April 2016).

Defusing the ongoing dissensus that continued to emerge through these developments was not easy and instances of *failure* continued to have to be *managed*. Sometimes these were overtly political (as we outline below) and sometimes more arbitrary in their nature. For example, whilst all parties expressed enthusiasm for a more responsive output-based approach to paying for ecosystem services, this was curtailed by European Commission regulations on the basis of payments which tied costing to the income foregone by not undertaking production activities (Wynne-Jones et al., 2013). In light of this impasse, civil servants suggested that there was little expectation of ‘proper PES schemes’ emerging through the vehicle of CAP payments (WG 1 interview August 2011; WG 2 pers. comm. October 2013). Instead, agri-environment payments were envisaged to work alongside other measures which could incorporate private finance and were not subject to the same regulatory restrictions. Hence new avenues have been *reassembled*, responding to the barriers and opportunities emerging.

Taking this forward, announcements were made that private money was being sought to supplement government funding (Davies, 2013a). Critically, this was also presented as a means to counter shortfalls in public-finance, which were increasingly being emphasised as EU budgets tightened:

“The Welsh Government is considering all possible funding streams for developing a more sustainable and robust land management. At a time of budgetary constraint WG is keen to explore the possibilities of attracting private funding to buy ecosystems services provided by land from the landowners.”

(WG, 2013a, p. 1)

³ The maps currently informing the targeting of the Glastir Advanced Scheme can be found here: <http://gov.wales/topics/environmentcountryside/farmingandcountryside/farming/schemes/glastir/glastir-advanced/2016-glastir-score-maps/?lang=en>.

Here it is evident that a desire to prepare farmers for a future of decreasing public monies was becoming a dominant factor in these ongoing reforms, reinforcing earlier discourses of accountability in public spending and the changing role of farmers: *“Going forward, we know we need less reliance on subsidy payments and more focus on business and profitability.”* (Davies, 2013b).

In terms of continued efforts towards *alignment*, and the *anti-politics* evident within actions to *reassemble*, what is notable here is the marrying of an impetus to cut public spending, which has an immediate detrimental impact upon the farming sector, with positive rhetoric around how this will ultimately improve and sustain their businesses. For example: *“One of the drivers for PES is to broaden the incomes for farms...to make them more resilient.”* (WG 2 interview March 2016).

However, despite efforts to sweeten the message and evidence of genuine sympathies from some civil servants, much of the rhetoric advanced did not appeal to farmers. In particular, farmers contested the perceived over-emphasis upon environmental concerns and insufficient coherence with their cultural identification as food producers (Wynne-Jones, 2013b; Farmer 1 interview April 2016); highlighting persisting contradictions underlying the *failures* witnessed. Consequently, many rejected the government scheme reinforcing a need to *reassemble*.⁴

To do this WG offered seed-funding to support PES pilot-projects, firstly through the ‘Nature Fund’ (WG, 2013b) and subsequently through the Sustainable Management Scheme [SMS], which is now a formal component of the 2014-20 Rural Development Programme. This has enabled them to reach-out to a variety of non-state actors prioritising: *“...action to further develop the interest in payment for ecosystem services...increase[ing] the potential for alternative incomes...”* (Davies, 2013c).

Public statements⁵ reveal a clear emphasis on collaboration and learning from ‘bottom-up’ approaches, with acknowledgement that the necessary knowledge and stimulus for successful arrangements is not always forthcoming from government staff. This de-centring of expertise is similarly affirmed in the scoring criteria for SMS applications which require strong local embeddedness and tailoring (WG, 2016b). However, this is not seen to simply equate with a devolvement of government control, as central resources have been allocated to cover the staffing and

⁴ See <http://www.walesonline.co.uk/news/wales-news/glastir-millions-pounds-could-be-returned-2025293>.

⁵ Specifically presentations by WG’s Head of Agricultural Strategy and Policy Unit at a ‘Future of Farming in the Uplands’ event (14.03.2017).

administration costs to catalogue and facilitate emerging projects, including the introduction of a PES practitioners group in 2015.⁶

Neither should these developments be viewed simply as a victory for farming interests, as the removal of government funding for the ‘entry level’ Glastir scheme from 2017 has meant the withdrawal of widespread benefits in favour of more environmentally-focused targeting.⁷ In addition, the process for application to the ‘advanced’ scheme now involves further levels of expertise and competition, which some interviewees felt placed it beyond the reach of ‘normal’ farmers (Farmer 1 interview April 2016). Applicants to the SMS have made similar accusations, demonstrating ongoing struggles over the agreed purpose of these funds (Farmer 2 interview January 2017).

Considering the longer term, WG 2 outlined a vision of a ‘mosaic approach’ whereby bottom-up collaborations can draw in diverse (non-public) finances to address both local (e.g. water quality) and international (e.g. carbon sequestration) concerns, but with a continued need for State funding to “*fill in the gaps*” (WG 2 interview March 2016). Moreover, in recent public presentations WG representatives outline that *‘private sector funding is not viewed as a golden bullet’*⁵ reflecting growing awareness of the challenges associated with drawing in private interests and ensuring sufficient levels of revenue from such sources.

Collaborations resulting from the Nature Fund and SMS have been diverse, often articulating strongly place-based aspirations (WG, 2016a). These exhibit similarities in the approach and framings used, but multiple articulations of PES are being produced, and in many instances applied to scenarios which do not exhibit clear criteria for such nomenclature (c.f. Boisvert et al., 2013). Yet, the reference continues to be popularised as an authorising label as we go on to examine in the following section.

2.5 The Pumlumon Project

The Pumlumon Project was one of the first PES schemes in Wales, beginning in 2006, led by Montgomeryshire Wildlife Trust [MWT], with an aspiration to “*enhance the natural capital of the project area to allow production of traditional farm produce*

⁶ See <http://gov.wales/topics/environmentcountryside/consmanagement/payments-for-ecosystems-projects/?lang=en>

⁷ See <http://www.walesonline.co.uk/business/farming/farmers-unions-accuse-welsh-government-10879528>

coupled with new ecosystem services that will provide the local community with a sustainable economic future” (MWT, 2008, p. 5). As such, it aimed to provide a new avenue for rural development in the remote and chronically marginalised upland area of Mid-Wales. Here, the assemblage-work of *forging alignments* between the conservation and farming sector was evident at the outset.

Echoing wider discourses at play in the Glastir policy forums, PES was framed as a better mechanism for incentivising farmers, granting them the autonomy to deliver outcomes applying their local knowledge rather than following prescriptions (MWT interview September 2007). This seemed to reflect a genuine empathy, in marked contrast with the position of other conservationists and civil servants at the time who were using PES as an implicitly *technical* move to depoliticise persisting conflicts around the future of farming and upland land-use (Wynne-Jones, 2012).

The payment mechanisms used were variable, drawing on charitable funding to pay for interventions on their own reserves as well as working with private landowners. In addition, they sought government funds wherever appropriate (e.g. Glastir). As such, MWT took a coordinating and brokering role, approaching farmers to pitch a range of desirable options and undertaking the administrative work of attracting funding – suggesting frictions in the reshaping of farmers as more proactive subjects (c.f. Higgins et al., 2014a). Private investment was also sought to offer freedom from the increasing insecurity and bureaucracy associated with public and third sector funding.

Securing funding involved *authorising knowledge* to legitimise the ecosystem service approach, which required the application of new scientific and policy expertise to name, delimit and measure desirable functions and outputs that could be captured within the project area. Links with wider policy programmes, including UK-wide ‘PES Pilots’ and the ‘Ecosystem Knowledge Network’⁸, were highlighted to provide official labels through which the project could be identified and benchmarked to reassure interested stakeholders. Similarly, connections to emerging platforms for carbon credit markets, including the Peatland Code⁹, were developed to show the credibility and comparability of the work they were undertaking.¹⁰

⁸ <http://ecosystemsknowledge.net/resources/programmes/pes-pilots/pumlumon>

⁹ <http://www.iucn-uk-peatlandprogramme.org/projects/pumlumon-project>

¹⁰ See http://www.iucn-uk-peatlandprogramme.org/sites/www.iucn-uk-peatlandprogramme.org/files/Pum_brochure.pdf.

Quantitative measurement was key in these processes of authorisation, in terms of determining the area of land under management, amounts of work undertaken, outputs delivered (e.g. carbon sequestered) and cost effectiveness ('return on investment'). Equally, comparison to the approach of schemes elsewhere was made to provide confidence in a 'tried and tested' concept despite asserting a distinctly local orientation (MWT, n.d.).

Despite much recognition of the project, work to-date has wholly been funded through charitable and public sector sources (MWT, 2014, pp. 18–19), and direct market payments have not been realised. To elaborate, investment from insurance brokers was sought to connect upland land-use with the mitigation of downstream flooding (MWT, n.d., pp. 8–9). However, discussions with the Association of British Insurers in 2011 revealed a lack of confidence in the efficacy of such proposals; reflecting the complexity of catchment hydrology and the difficulties controlling and isolating specific functions.

Water companies were also approached to explore payments for water quality. This was championed due to the perceived simplicity of attaching a value to upstream land management, as the cost-avoided of downstream treatment. These mechanisms have been granted support by the regulatory body OFWAT, who have permitted a levy to be placed on water bills to fund catchment management. Nonetheless, Dwr Cymru (Welsh Water) have been unwilling to participate in the upland regions of Mid-Wales because water here is cleaner than in other areas where companies have entered into partnerships, and so there is no demand as yet (WG 2 pers. comm. October 2013).

Consequently, whilst the Pumlumon Project had attracted £2.3 million of funding by 2014, concerns have been raised about the future sustainability of their financing mechanisms. Future priorities therefore include linkages to 'offsetting' markets; monies from 'corporate social responsibility'; and lobbying for an 'ecosystem service premium' on utilities and insurance payments (MWT, 2014, pp. 4–6). Yet, it is equally acknowledged that *"the challenge may be one of re-directing and re-naming sources of existing funding, rather than of creating entirely new and additional sources of funding"* (ibid, p. 4) – pre-empting some of the Welsh Government's more recent statements, which acknowledge a more multi-stakeholder and multi-layered approach and perhaps indicating a new strategy in their efforts to *reassemble* the project going forwards.

Despite the sense that WG have now embraced a more plural vision, discussions with WG's lead for PES in 2013 demonstrated a shift in their attentions as they realised that drawing funding into such remote upland locations was continuing to prove challenging. As a result new assemblages started to gather interest elsewhere (pers. comm. October 2013).

2.6 Ecosystem Enterprise Partnership - Ecobank [EEP-Ecobank]

We witnessed a realignment of WG's PES agenda with lowland farming interests and the more developed coastal region of Pembrokeshire in South-West Wales where opportunities for private sector investment looked more promising. Here diffuse pollution from intensifying dairy production was threatening water quality (in contrast to the scenario above) and limiting development due to the lack of compliance with the EU's Water Framework Directive and targets for the Pembrokeshire Marine Special Area of Conservation. Local waterways were *“considered as ‘full’ with no headroom...for additional [nutrient or sediment] loading”* (EEP-Ecobank, 2015, p. 30). Consequently, proposed developments causing further nutrient discharge were being vetoed by the statutory environmental body Natural Resources Wales [NRW].

Tackling these issues, regulatory approaches were seen to be ideologically unattractive but also ineffective at lowering pollutant levels even if they could stop further increases. Equally, these issues were poorly targeted in the design of agri-environment schemes (up until Glastir) (PCF interview May 2016). To address the persisting problem this posed, the EPP-Ecobank was initiated by WG and NRW in 2015, inspired by the success story of *First Milk*, a farmer cooperative operating in the area. *First Milk* secured a permit for a new effluent plant in 2014, by committing to offset the additional nutrient load through nutrient management plans on some of their supplying farms.¹¹ NRW staff were then inspired to scale up the approach (PCF interview May 2016). Supported by WG's Nature Fund, a community interest company *Pembrokeshire Coastal Forum [PCF]* sought to assemble:

“a partnership framework between land managers, industry, commerce, government and third sector working collaboratively to develop and pilot an Ecobank – a nutrient offsetting scheme for the Milford Haven and Cleddau catchment.”

(EEP-Ecobank, n.d.)

¹¹ This did not involve financial compensations, simply the technical exercise of demonstrating nutrient savings.

This attracted considerable interest from a large number of stakeholders, including private sector actors (see Figure 6), explaining WG's initial excitement about the project.

Milford Haven energy port; RWE energy company; Dwr Cymru; Welsh Government; Natural Resources Wales; Pembrokeshire Coast National Park Authority; Pembrokeshire County Council Pembrokeshire Local Action Network for Enterprise and Development [PLANED]
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Figure 6: EEP-Ecobank Stakeholders

Realisation: Author.

Framing a potential solution to an intractable problem in the terms of PES had an important *authorising* effect. Competing interests were being *rendered technical*, and accordingly de-politicised by their negotiation through a market forum. Nevertheless, multiple potentially conflicting priorities are evident amongst the partner grouping and worrying exclusions became apparent. Notably, not a single farmer representative was directly involved, even though agriculture accounts for about 95% of the local nitrate loading (EEP-Ecobank, 2015, p. 47) and the *First Milk* exemplar was wholly dependent upon farmer participation. Farmers were only indirectly represented through *PLANED*. This was justified on the grounds of practicability due to the tight time schedule during the early stages of project inception (PCF interview May 2016).

In order to *render technical* pollution rights, possible nutrient trading structures were explored through a feasibility study (undertaken by external consultants) which reviewed a range of other ecosystem banking initiatives, including reverse auctions and brokering arrangements (EEP-Ecobank, 2015). Interestingly, the consultants concluded that regulatory efforts could help to address the nutrient problem, even though a PES approach was prioritised by stakeholders:

“Whilst an innovative approach, utilising the market wherever possible, demonstrates leadership...more traditional methods of reducing loading may actually be the best approach... The EEP should not be averse to combining approaches wherever possible.”

(EEP-Ecobank 2015, 91)

Similarly, it is notable that the initial approach of nutrient management planning, used by *First Milk*, is equally relevant within a regulatory framework. Consequently, some

commentators have argued that the PES label is being forced in such arrangements and does not accurately reflect the relations and incentives in place – a point that was not disputed by WG representatives¹² – but the allure and *authorising* qualities of this nomenclature explain its awkward application.

The feasibility study also highlighted a need for ‘scientific robustness’ behind management interventions, prompting reference to lists from UK Government scientists to ensure the credibility and measurability of techniques adopted. But some difficulties have been encountered here, in terms of how measures relate to meaningful action. Specifically, excess nitrates have been singled out as the key pollutants to be addressed, whereas concerns around phosphates and sediment have been put on hold, purportedly due to the more complicated nature of measuring and monitoring them (WG 2 interview March 2016; PCF interview May 2016). Yet recent scientific studies have placed such rationales in question, showing potential complications with nitrates also (Van Meter et al., 2016). Tensions are exposed here surrounding the level of precision and forms of authority required to achieve acceptable forms of commodification (Robertson, 2012). Outputs have to be clear enough to provide confidence to investors and appease regulatory interests, but there is also pressure to arrive at ‘practical solutions’ on which all partners can agree. Hence a compromise is met between advancing levels of technicality to ensure accuracy and the adequate levels of information required to move forward. For the Ecobank it is not yet clear where this balance lies.

These potential *failures* continue to be *managed* in ongoing discussions and data gathering that are now being orchestrated in a follow-on project phase funded through the SMS. Further failures yet to be resolved are also apparent in the lack of financial contributions from other stakeholders beyond government, despite early assumptions that the Ecobank was more attractive to private interests. This prompted the Ecobank coordinators to pitch the project idea to the European Investment Bank in Luxembourg to obtain seed funding to pay for a brokering organisation and trial trading (WG 2 interview March 2016).

¹² This was raised in a PES workshop on 30.04.2015:
http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/lifesciences/grandchallengesinecosystemsandtheenvironment/eventssummary/event_9-4-2015-14-45-14

The scope for the government itself to contribute is limited due to overall budget constraints and the restrictions on double funding.¹³ Nevertheless, WG is clearly willing to assist wherever it can; further confirming their eagerness to remain in a steering position while at the same time devolving governance responsibilities. Moreover, this case demonstrates that government involvement continues to be required to establish trust in potential PES markets and to attract financial and institutional buy-in.

2.7 Discussion and Conclusions

From the empirical analysis, we see that PES is now evident as a mosaic of arrangements – including different actors, mechanisms and modes of relation. These operate over different scales, sometimes to govern discrete areas of territory (i.e. multiple modalities within one space including a farm or ‘project’ area), sometimes addressing different geographical units (i.e. differences in what the national Glastir schemes seek to govern and the objectives of a ‘local’ e.g. catchment-based project). They also incorporate different scalar connections, linking place-based actions to national or international concerns (e.g. biodiversity and carbon), as well as including more direct actor to actor relationships (e.g. water companies and farmers). There is no unified objective in terms of the preferred approach and scalar focus, but a greater acceptance that different initiatives can achieve diverse ends. This differs from earlier readings where we see more uniform transitions to implement mechanisms across a national or regional territory (Higgins et al., 2014a; McElwee, 2012; Wynne-Jones, 2013b).

Appropriate mechanisms are worked out in place, depending on the opportunities and problems in question. PES is not advanced as a pre-formed and fixed template, but provides a container to explore possibilities. Whilst there *is* a sense of striving towards ‘properly functioning markets’, with a favouring of private capital, there is also space and freedom to explore workable (i.e. acceptable and adequate) methods whatever they involve (Robertson, 2012). Critically, these all sit together under the umbrella term of PES despite the diversity in their form (Boisvert et al., 2013). PES is powerful in its authorising capacity (Rodríguez de Francisco and Boelens, 2015) but does not necessitate specific transformations or indeed homogeneity.

¹³ WG could not fund farmers to address nutrient management through Glastir and pay them again through other RDP measures.

Linked to this, we see that PES is not just about ecosystem services. It is used to address a range of different concerns, offering a new opening and stage on which to negotiate longstanding issues (Potter and Wolf, 2014; Wolf, 2014). These include: environmental degradation (to serve local, national and global objectives); conflicts over land-use; managing public spending cuts; reducing subsidy dependence within farming; chronic rural development needs; and obstacles to future economic growth. Consequently, a variety of actors have become involved, working opportunistically to use PES as a vehicle to advance their own causes (c.f. Van Hecken et al., 2015). This has necessitated considered efforts to align diverse rationales to serve similar ends. Observing the oscillations and reformulation involved, it is impossible to frame PES as a coherent and strategic vision heading towards an optimal endpoint. PES is not simply a global agenda that has been ‘parachuted in’ or ‘rolled-out’.

Aligning with Van Hecken et al.’s (2015) call for a ‘power-sensitive and socially-informed analysis of PES’, we have considered how these different interests are served, noting what is squeezed out and elided through the failures and reassembling undergone.

“Understanding how PES is shaped, resisted, reworked and adapted locally essentially boils down to analysing who is able to frame the problems and set the rules, how they do so and to what end, and why it is possible for them to do so.”

(ibid: 123)

PES empowers, aligns and depoliticizes, but not always successfully and not evenly. We have seen clear gains amongst environmental NGO’s and civil society organisations, due to their specialised environmental knowledge, tools of measure and networking capacities. But this also creates new dependencies where farmers are beholden to brokers and ‘experts’ to legitimise their actions and connect to sources of financial capital. The aspiration for PES to provide greater autonomy for farmers has not yet been realised. Moreover, we have witnessed a narrowing of the criteria determining which farmers can participate (e.g. on a target map, or possessing appropriate social connections). This suggests that past deference to the farming unions in policy making forums (Wynne-Jones, 2013b) has successively been destabilised through the discrete politics of technical foreclosure.

Tensions of geographical marginalisation are equally important to note, given the difficulties witnessed in supporting PES in ‘deep rural’ locales, despite the proliferation of energies directed at this cause. To be clear, rural spaces and actors

are not simply receiving and being remoulded by PES, it is being used and initiated by them and they in turn are affecting the wider circulations of PES discourse (c.f. Woods et al., 2015; Wynne-Jones, 2012). However, long standing issues of marginalisation have not been fully remediated. Identifying and *isolating* potential buyers is as fraught as the commodification processes required to alienate desirable goods for sale. This is precisely why we have ‘adequate’ hybrid measures, incorporating proxies and proxy buyers, and should not be read to indicate that we need better or more complete commodification. Rather, the critical parameter is reaching enough political will and trust for action (Potter and Wolf, 2014; Robertson, 2012). Comparative work using the assemblage approach allows us to better see this; to acknowledge the accommodations in place and how different actors are able to set the rules determining these.

Equally, by attending to moments of failure, we contend that an assemblage approach enables us to bear witness to tensions and fractures (i.e. the changes of tactic and reactions to rejections), which could easily be elided losing much of the explanatory insight into why PES is meeting with difficulties. Moreover, even when successful dialogue is achieved, full alignment of agendas is not so seamless – threatening to undermine coalitions and stabilisations into the future. In particular, the aspiration to reshape farmers as more independent and responsive subjects has managed to combine disparate interests up to a point. But the politics of subsidy reform has persisted as a trenchant issue (even – and perhaps more so – in the face of Brexit), which cannot simply be removed by an exercise of recoding.

Addressing questions of politics and power, we also need to consider the implications for our understanding of the State. Whilst the emerging mosaic of PES can appear chaotic, government has still set the terms of engagement. The SMS is used to create a wider forum, which suggests opportunity and openness, but still delimits. This is a masterful work of consensus building and anti-politics; demands for greater local responsiveness and appropriateness are delivered whilst also ensuring engagement and co-operation from and between actors. The State having failed to directly manage these tensions previously has stepped back whilst appearing to concede the need for other actors’ skills and knowledge.

Whilst there is more room for manoeuvre in terms of deciding which ecosystem services will be governed, where, and precise modalities to be employed, a set framework is still laid out with scoring on the basis of prescribed criteria (WG,

2016b). This is a fascinating step in the crafting of governmentality given the inherent demand for innovation (c.f. Bulkeley and Castán Broto, 2013), the ability to set one's own mode of self-government, and the data harvesting inherent (through requisite monitoring by scheme applicants). As with other recent moves in the advance of PES (such as the Glastir maps and PES practitioner group) WG seeks to gain control and oversight whilst giving power. Although it would be naive not to acknowledge the pressures of budget cuts within this move, recent discussions also assert the additional costs of developing such locally adapted mechanisms (WG1 pers. comm. March 2017). Hence, we suggest that this strategy responds as much to the complexity of problems now in hand, leading to a need for greater co-production.

Through this chapter we have sought to enrich existing evaluations of PES, by attending to the temporalities and mobilities that produce geographical difference. We have also sought to show the hard work and compromise involved, which takes us away from damning judgement of PES as a neoliberal project towards a more cautious engagement, which highlights questions of justice and exclusion, but also acknowledges the sincere ambitions many actors have and the frictions they encounter. Whilst our reading indicates much promise in the assemblage approach, it is clear that it can be refined and extended by both a more expanded focus (to follow connections to wider PES assemblages) and a more in-depth one than has been possible in the space of this chapter. It is also important to acknowledge our own roles as academics, not only in terms of the power of 'PES science', but more broadly in a range of articulations where we authorise and accentuate the proliferation of PES as a unified category. Otherwise, there is a danger that the depth and sophistication of the assemblage reading remains detached from more everyday expressions which can reproduce simplistic framings and prevents productive learning within the ongoing assemblages that we work with.

Chapter 3 – Co-producing better land management? An ethnographic study of partnership working in the context of agricultural diffuse pollution

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Abstract: Partnership working has become a normative principle within agri-environmental governance. With more and more benefits becoming attributed to closer multi-stakeholder collaboration, more public monies are being directed towards this cause. These benefits have been studied widely and are usually presented in terms of their contributions to environmental, economic and/or social objectives. However, in contrast to these reported outcomes of partnership working, the practical ways towards them have received little attention. What does it mean to work together on a day-to-day basis? More specifically, how do stakeholders become trusted partners, bridge interests and coordinate their actions? What collaborative working culture becomes established within partnerships and how does this in turn affect wider governance outcomes, expectations and aspirations? Answers to these questions are not only important to better understand the factors that contribute to successful ways of partnership working, but also to account for its limitations. This paper responds to this research need by drawing on the example of Farm Herefordshire. This cross-organizational partnership promotes profitable farming, healthy soils and clean water to address the problem of diffuse pollution from agricultural practices within the Wye catchment in the UK. The insights from this case study contribute to the literature in two major ways: First, the paper follows prompts to study such modes of collective action holistically and bottom-up to capture all their contributions and implications. It does so by employing an ethnographic research approach to investigate the social interactions and struggles that characterize joint working. This commands attention to the backstories, the actual work meetings, the discussions, the processes of consensus building, and the joint actions undertaken; Secondly, the paper connects with wider social science concerns around the underlying processes and practices of governmentality that are essential for establishing social and ecological orders. Thus, the paper explores how everyday practices of partnership working contribute to the co-production of institutions, discourses, identities, and representations – which in this case become strategically deployed to nudge – rather than revolutionise – better land management practices.

Keywords: Partnership working; co-production; agriculture; diffuse pollution; good farming

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3.1 Introduction

Several benefits – and indeed hopes – have become associated with partnership working in agri-environmental governance. These benefits are usually presented in terms of their contributions to environmental, economic and/or social objectives. Whereas collaboration between farmers, for instance, may help avoid further landscape fragmentation (Emery and Franks, 2012; Leventon et al., 2017), reduce long-term transaction costs (Franks, 2011), help (re-)build social capital (de Krom, 2017; Mills et al., 2011; Wynne-Jones, 2017), and encourage peer-to-peer learning (Lucas et al., 2019), the inclusion of non-farming actors such as environmental charity groups within wider agri-environmental collaboratives promises more balanced and legitimate outcomes over competing demands through the generation of mutual trust and understanding (Prager, 2015a; Prager and Vanclay, 2010). These latter examples of multi-actor '*partnerships for sustainability governance*' (McAllister and Taylor, 2015, p. 86), in particular, have come to be viewed very positively for their wide-ranging contributions to more sustainable land management. According to Prager (2015a, p. 375) those contributions can include '*policy implementation and service provision; coordination and mediation; awareness raising and behaviour change; [...] maintenance and protection of landscapes [...]; and income generation and economic benefits*'. As such partnership working is understood as a vehicle for sustainable development (Prager, 2015a, 2015b), as much as it is seen as a conduit to foster more equitable, democratic and adaptive governance systems (Hahn et al., 2006).

However, in contrast to these potential outcomes of partnership working, the actual ways towards them – including what it really means to work together on a day-to-day basis – have received little attention. So far, most studies have either approached the topic somewhat theoretically – by exploring the barriers, pathways and motivations of farmers to work together within potentially revised versions of the EU's agri-environment schemes (Emery and Franks, 2012; Franks and Emery, 2013; Leventon et al., 2017) – or somewhat distanced, by gathering and contrasting the ex-post accounts of various actors involved in agri-environmental collaboratives (Enengel et al., 2011). More process- and practice-oriented research was rarely conducted and where this was done, the insights mainly derive from researcher-led focus group discussions (see e.g. Leventon et al., 2017). The resulting narratives are therefore largely devoid of the social interactions and struggles that characterize

partnership working, and most studies remain silent about the dynamics that emerge from such collaborative activities. This paper aims to address this gap by exploring the everyday aspects and meanings of partnership working. In particular, how do different stakeholders become trusted partners, bridge their interests and coordinate their actions? What codes of conduct become established within partnerships? Which spaces for discussion open-up or are closed down? How are different roles and characteristics reworked within such groups? And how does all this in turn affect the representation of the governance problems and the solutions at hand?

Answers to these questions are not only important to better understand the factors that can contribute to successful ways of partnership working, but also to account for its limitations. Because, as McAllister and Taylor (2015, p. 87) pointed out '*Partnerships are no panacea*', in spite of their potential benefits. As with any governance instrument, such modes of collective action entail costs and risks. They are embedded in power relations, they can become captive to certain interests, they may be lacking in transparency, accountability and inclusiveness (Dandy et al., 2014; McAllister and Taylor, 2015), and they may turn out to be counterproductive for bringing about change (Blühndorn and Deflorian, 2019; Turnhout et al., 2020).

This paper will provide more clarity about this ambivalent picture of partnership working by exploring the example of Farm Herefordshire. This cross-organizational partnership addresses the problem of diffuse pollution from agricultural practices within the Wye catchment of the United Kingdom (UK). The insights from this case study contribute to the literature on several fronts: First, the paper follows Prager's (2015a) prompt to study such modes of collective action holistically and bottom-up to capture all their contributions and implications. It does so by employing an ethnographic research approach to investigate the social interactions, struggles and dynamics that characterize joint working. This commands attention to the backstories, the work meetings, the discussions, the processes of consensus building, and the joint actions undertaken. Second, and most notably, the paper connects with wider social science concerns around the underlying processes and practices of governmentality, which are essential for establishing social and ecological orders (Jasanoff, 2004). Thus, the paper explores how everyday practices of partnership working contribute to the co-production of institutions, discourses, identities, and representations which in this case all become strategically deployed to nudge – rather than revolutionize – better land management practices. Finally, the

paper helps to fill an empirical gap. According to Emery & Franks (2012) most insights about environmental partnership working derive from case studies in Germany, Australia, and the Netherlands, yet detailed accounts of similar examples are largely missing for the UK (but see e.g. Dandy et al., 2014; Wynne-Jones et al., 2019). Overall, the insights of this case study draw a more nuanced picture of the contributions and limitations of partnership working, which should prove useful to inform and improve similar approaches elsewhere.

The remainder of this article is structured as follows: The next section explains the theoretical perspective employed in this paper. This will be followed by the methodology (Section 3.3) and some background information about the Farm Herefordshire case study (Section 3.4). Section 3.5 then presents and discusses the co-products of partnership working, which will provide the basis for some concluding remarks in Section 3.6.

3.2 The idiom of co-production and its relevance in agri-environmental contexts

Given that partnership working is increasingly common within agri-environmental contexts it is fair to say that this phenomenon is on its way to become a new normative governance principle: *'With its rhetorical focus on cooperation and participation, partnerships seem to embody the inclusive, joint problem-solving approaches promoted in sustainability discourses'* (McAllister and Taylor, 2015, p. 86). Rightfully so, this rhetoric has now come under closer scrutiny with several studies examining the partnerships' *'politics of co-production'* (Turnhout et al., 2020, p. 15). For example, whereas Dandy et al.'s (2014) analysis of collaborative natural resource management has demonstrated the limited capacity for power sharing within such partnerships due to pre-defined agendas and pre-existing power relations, Turnhout et al.'s (2020) literature review on the subject has highlighted the role of de-politicization dynamics that can actually prevent wider societal transformation taking place. In a similar vein – but put even more provocatively – the performativity of partnership working has been called into question as it could also be seen as simulative politics which may help to sustain the unsustainable status quo (Blühdorn and Deflorian, 2019).

While I agree that more critical analysis of partnership working is needed, I believe that there remains an untapped potential when it comes to the explanatory power of the co-production term itself. Within the literature cited thus far, co-

production is usually understood as *‘a shorthand for participatory modes of knowledge production’* (Turnhout et al., 2020, p. 15), and thus remains explicitly dissociated from the analytical conceptualization of this term as proposed by Sheila Jasanoff (2004) and used in Science and Technology Studies. Jasanoff’s *‘idiom of co-production’* (Jasanoff, 2004, p. 1) urges us to look for more accurate and nuanced accounts of *‘the complicated interplay of the cognitive, the institutional, the material and the normative dimensions of society’* (Jasanoff, 2004, p. 17), without ascribing determinism to either social or natural order. To do so, we are directed to the instruments that sustain or establish moral, metaphysical, political or symbolic order, namely all those instances in which identities, institutions, discourses and representations are made (see Table 3).

Table 3: The four instruments of co-production.

Instrument	Description
Making identities	the ways in which human, non-human, individual and collective identities are formed that determine order and define roles, with implications for power and knowledge.
Making institutions	the setting of common rules, norms, processes, methods, etc. that form the repertoire of socially and politically accepted behaviour that qualifies certain ways of knowing and action.
Making discourses	the formation of a common language allowing its users to speak about and act upon a new or old problem in an authoritative way.
Making representations	The means and practices used to produce intelligible scientific, social or political representations.

Source: paraphrased from Jasanoff (2004, pp. 39–41).

As such these four instruments of co-production offer analytical pathways that allow us *‘to explore how knowledge-making is incorporated into practices of state-making, or of governance more broadly, and, in reverse, how practices of governance influence the making and use of knowledge’* (Jasanoff, 2004, p. 3).

Within the field of agri-food studies this has led to important insights, for example, about productivism in agriculture and food systems. According to Iles et al. (2017, p. 965), *‘the making of productivist regimes is founded on 150 years of the co-production of knowledges, technologies, institutions, cultures, organisms, humans, and markets’*, which helps to explain its persistent legitimacy and credibility. By following Iles and colleagues’ suggestion, I will use *“co-production” as a storytelling idiom’* (2017, p. 947) and apply it in this paper to partnership working and the specific but widespread problem context of governing agricultural diffuse pollution. Doing so

promises multi-dimensional insights into this problem context and into the aforementioned set of instruments.

Identities, institutions, discourses, and representations are of course already seen as important leverage points to address agri-environmental problems, but most studies continue to treat them in isolation. For instance, Inman et al.'s study concluded that *'the reality of the situation [...] is that a significant shift in identities and behavioural beliefs within farming communities is likely to be required before DWPA [diffuse water pollution from agriculture] mitigation behavior becomes embedded* (Inman et al., 2018, p. 22). The focus on farmers' identities is a common thread in the literature leading to similar diagnoses (see also McGuire et al., 2013), and yet our understanding as to how institutions, discourses and representations come into play with identities remains rather limited. The same is true for how different governance approaches such as partnership working contribute to identity shifts on and beyond the farm level.

Indeed, the idiom of co-production serves as a reminder to pay attention to shifts within any of the other instruments, too: We know, for example, that laws and regulations alongside social norms and voluntary actions all affect farmers' behaviour in relation to diffuse pollution (Blackstock et al., 2010), yet we do not know much about how partnership working in turn shapes such formal and informal institutions and what role the other instruments have in re-shaping the rules of the game. Similarly, discourses play an integral part in knowledge and learning processes both on the farm-level (Goulet, 2013) and of course also among all those who seek to govern the land-based sector. Yet again, empirical insights about the narratives, stories and languages used within partnerships to speak about and act upon a shared problem are largely missing. Discourses are however likely to have a significant impact on peoples' understanding of and action towards diffuse pollution. Lastly, the means and practices used by partnerships to produce intelligible representations of the problem and of the solutions at hand should give us some indication of the politics, rationales and strategies employed by partnerships to bring about desired change. By exploring all four analytical pathways of co-production we should obtain a fuller picture of partnership working and thus gain a better understanding of how this plays out in the local context of Herefordshire.

3.3 A note on methods: Studying partnership working through the ethnographer's lens

To shed more light on partnership working in the case of Farm Herefordshire this paper draws on empirical material gathered through ethnographic fieldwork. Participant observation (Bernard, 2006; DeWalt et al., 1998) has played a pivotal role within this qualitative research approach as it has not only contributed valuable first-hand insights, but also allowed for continuous analysis through regular reiteration and triangulation of data received from other research activities (Patton, 1990) (see Table 4 for an overview). This is noteworthy, because participant observation has rarely been taken into account as a research method when studying agri-environmental collaboration or partnership working (although see Dandy et al., 2014). Most studies have drawn on questionnaire data, interviews, or focus group discussions, even when an explicit “*insider perspective*” (Prager, 2015a, p. 383) or ‘*bottom-up approach*’ was pursued (Leventon et al., 2017; Prager, 2015a).

Table 4: Overview of research methods and data.

Research method	Participant observation	Semi-structured interviews	Document analysis
Description of data sources	Farm Herefordshire steering group meetings	NGO staff	Reports
	On-farm demonstration events	Civil servants	Leaflets/Brochures
		Farm advisors	Websites
	Wye catchment partnership meetings	Farmers	Newsletters
	Job shadowing / Team meetings		Videos
	Other information events		E-mails
Total	n=30	n=19	n~70

My own positioning as ‘*participating observer*’ (Bernard, 2006, p. 347) became possible through long-term fieldwork lasting from October 2016 until December 2017. During this time, I was loosely affiliated as a PhD researcher with one of the organisations involved in the partnership. This charitable organisation was identified during an earlier scoping study¹⁴ (March–May 2016) and opened the door to the governance network that had developed around Farm Herefordshire. In particular, I was allowed to join staff meetings of a farm adviser team, I was able to job shadow

¹⁴ The scoping study followed the principle of snowball sampling and included ten semi-structured interviews with key informants as well as a number of site visits including to the study area.

individual staff members of various partner organisations; and I was invited to a number of partnership meetings including those of the Steering Group of Farm Herefordshire. The latter provided a space for the partners to discuss practical and strategic matters of concern and to find consensus about them. The Steering Group is made up of one or two representatives of each partner organization. Joint meetings took place every three months and were held in turns in one of the partners' offices. Each meeting lasted for about two hours and their nature was characterized by constructive exchange, which gave all participants in principle an equal opportunity to express their opinions, to think out loud about new ideas, but also to wander from one topic to another – on and off the agenda.

While this provided valuable insights into the internals and politics of partnership working, on-farm demonstration events gave me opportunities to observe how the partners engage with farmers. Thus, over the course of this research I also joined several organized farm walks during which farmers and other land-based actors were made aware about the phosphate issue within the Wye catchment. Such events took place across the county and covered a wide range of topics including 'Healthy Livestock from Healthy Soils', 'Cover Crops and Conservation Seed Mixtures', or 'Boosting Yield and Profit through Strip Tillage'.

In parallel to participant observation, I conducted 19 semi-structured interviews covering a cross section of organizations and actors who were either directly involved in Farm Herefordshire or in one way or another connected to it (e.g. key farmers). Most interviews were conducted at the workplace or home of the respective interviewee – and in the case of farmers, they were usually accompanied by a transect walk of the farm. All interviews were tape recorded and later transcribed. Each interview lasted for about 1-2.5 hours and mainly contained open-ended questions to gather the interviewees' experiences, opinions, and expectations of partnership working. However, they also served as an opportunity to clarify some of the aspects emerging during the various work meetings I had attended and often provided an atmosphere in which more personal opinions and sensitive issues could be raised and expressed. Providing anonymity for my interview partners in such a tight-knit network was challenging but hugely important due to the sensitive nature of many aspects involved in partnership working and due to the variety of personal viewpoints that often must step back behind wider organisational agendas. I have

therefore anonymised all interviewee's responses (i.e. FH member) and use pseudonyms throughout this text to protect people's identity.

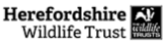
Lastly, an extensive review of secondary sources related to Farm Herefordshire has provided complementary insights as well as important leads as to how the partnership and the actors involved presented themselves externally. These documents and information sources included Farm Herefordshire leaflets and brochures, partnership reports, emails and newsletters advertising on-farm events, websites of partner organisations, and jointly produced YouTube videos.

3.4 The turn towards partnership working in Herefordshire

3.4.1 The background story

Despite the increased interest in partnership working it is not a new phenomenon. The turn towards partnership working in the county of Herefordshire has happened gradually and appears to be the consequence of deepening inter-professional relations, as much as it is an attempt to counter further fragmentation in a governance landscape that has become much more diverse since the launch of the first agri-environment schemes in the 1980s (Dwyer, 2014). This becomes obvious when we look at the development of the cross-organizational partnership Farm Herefordshire, which offers farmers guidance and advice on land management under the slogan of '*profitable farming, healthy soils and clean water*' (Farm Herefordshire, n.d.). Viewed in isolation this partnership could be seen as yet another governance project (Munck af Rosenschöld and Wolf, 2017), which tries to tackle the problem of agricultural diffuse pollution by forming a coalition between the third sector, industry organisations, government bodies and an institute of higher education. Since its official launch on 25 November 2015 it has grown to 12 partner organizations which are listed and briefly described in Table 5.

Table 5: The organizations currently involved in the Farm Herefordshire partnership

Type	Name	Description
Third sector organisations		The Rural Hub Herefordshire is a community interest company providing information for farmers and rural businesses via a monthly newsletter and website.
		The Wye & Usk Foundation is a conservation charity concerned with fisheries, habitats and water quality in England and Wales.
		The Brightspace Foundation is a non-profit community interest company that promotes sustainable development within Herefordshire; it emerged from the Bulmer Foundation.
		Herefordshire Wildlife Trust is the local branch of the UK-wide conservation charity, the Royal Society of Wildlife Trusts.
Industry organisations		The National Farmers Union [NFU] is a membership association for farmers in England and Wales. NFU is a partner organization of the European agricultural umbrella organization Copa-Cogeca.
		The Country Land and Business Association is a membership organisation for land, property and business owners in England and Wales.
		The Agriculture & Horticulture Development Board is a statutory levy board promoting UK agriculture.
		The Campaign for the Farmed Environment is an industry-led initiative that promotes voluntary environmental management practices to farmers.
Government bodies		The Environment Agency [EA] is a statutory body responsible for protecting and enhancing the environment in England.
		Natural England [NE] is a government-funded body responsible for protecting the environment. Its remit includes the delivery of agri-environment schemes in England.
		Catchment Sensitive Farming is a program run by Natural England which provides advice and funds to farmers to improve water resources.
Higher Education		Herefordshire & Ludlow College is an institute of higher education running several degrees in the land-based sector.

However, this coalition did not start from scratch and neither did the commitment to collaborate on the issue of agricultural diffuse pollution emerge suddenly. Many of the organizations that are currently involved in Farm Herefordshire had already been working together for several years trying to promote more sustainable land management practices and agri-environment schemes to farmers. Natural England [NE], the non-departmental government body in charge of protecting and improving

the natural environment in England, for instance, employed Catchment Sensitive Farming officers to help reduce agricultural water pollution.¹⁵ The local liaison group of the industry-led Campaign for the Farmed Environment [CFE] recognized water and soil management as a target area *‘to demonstrate how the industry collectively takes responsibility for achieving environmental benefit alongside profitable farming’* (CFE, 2013), and environmental charity groups such as the Wye & Usk Foundation or the local Wildlife Trust had already worked with farmers, regulators, and the agro-industry on a project-by-project basis.

Overall, these past experiences have helped to establish trust and routinized workflows between those organizations, which allowed them to further their own agendas by working together. For example, by signposting farmers to environmental advice and public monies everyone could gain, either in terms of farmers’ uptake of recommended conservation measures (of particular interest to environmental charity groups), more successful policy implementation as measured in land covered under countryside stewardship agreements (of particular interest to government), or in the form of financial compensations for environmental measures (of particular interest to farmers).

The launch of first formal joint initiatives thus only seemed logical. One of these was Green Futures which already began in 2005. This earlier initiative adopted *‘a “one stop” and non threatening approach to knowledge-transfer’* (Bulmer Foundation, 2015, p. 61), which in practice meant co-organizing and co-hosting regular events to inform the local farming community together about any relevant changes in agricultural policy and environmental legislation. Accordingly, a tight network of key actors has emerged over time and across the traditional governance divides which is keen to engage with all of the 2120 registered farm businesses within the county including those farmers who the members of this network consider as *“the hard to reach”* (ibid.).

To some extent those efforts paid off as between 60-75 percent of all farmers in Herefordshire make use of an external advisor when applying for agri-environmental funding based on unrecorded, local estimates (FH member, 18. November 2016). While this may help to explain why farmer participation in such schemes lies slightly above the national average (FH member, 2. March 2017), it certainly demonstrates that partnership working in Herefordshire has *‘a long history’*

¹⁵ This programme was recently integrated into the UK’s agri-environment schemes and can now be accessed by farmers through the mid-tier element of the Countryside Stewardship.

(Wye Catchment Partnership, 2017, p. 3) and was not imposed by any superior entity.

3.4.2 The common challenge

A whole new dynamic came into this collaborative network when the rivers Wye and Lugg failed to meet their phosphate targets (see Figure 7 for an overview map). By 2015, 44 out of 50 water bodies in the county were considered to be in moderate, poor or bad status due to elevated nutrient and/or sediment loadings negatively impacting on the water quality and the number and diversity of invertebrates and fish populations. The Wye and the Lugg are home to rare species including otter and Atlantic salmon and hence include stretches designated as Sites of Special Scientific Interest (protected under UK law) and Special Areas of Conservation (protected under the EU's Habitat's Directive). The Environment Agency and Natural England declared phosphate losses from farmlands as key pollutants (alongside equal contributions from point source pollution from wastewater treatment plants), which not only adversely affect the environment, but also further housing and industry developments within the county.

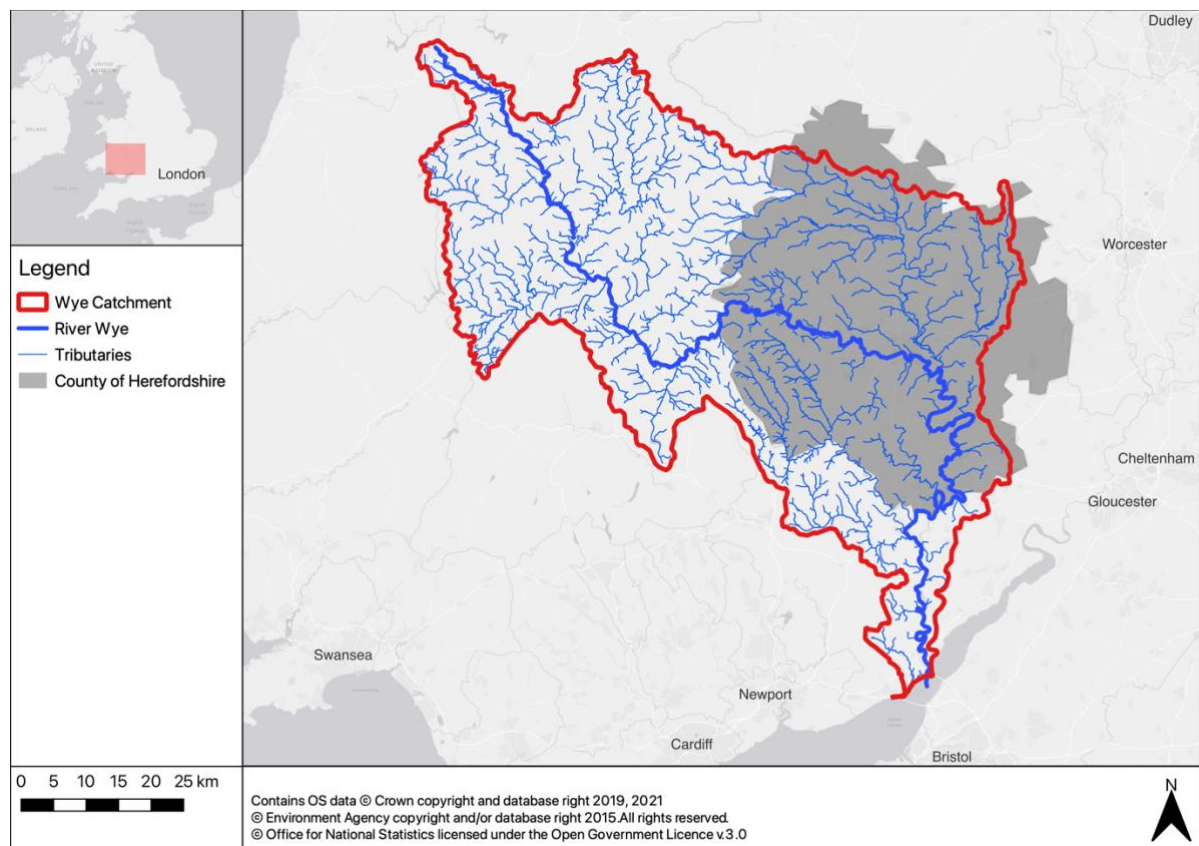


Figure 7: Location of the river Wye, the catchment area and the county of Herefordshire.

Realisation: Author.

Thus, economic growth has come under threat due to a potential development moratorium if the water quality would not be brought back into compliance with environmental regulations. Ultimately this put the future of the county into jeopardy as an aging population, few industries, and low tax revenues seem incompatible with future austerity plans that expect counties across the UK to become less dependent on central government funding. Economic growth and environmental governance have thus become issues of political survival as well as matters of fierce contestations, as ironically one of the few growth factors lies in the booming poultry sector (Davies, 2017), which adds to the diffuse pollution problem through the vast amounts of phosphate-loaded chicken muck readily available to be spread on local farmlands.

Providing advice on better land management has thus become ever more important and eventually led the Environment Agency – in their own words – to ‘hijack’ (FH member, 6 July 2017) the existing collaborative network and use it for the delivery of a Nutrient Management Plan which it had imposed onto the county. The successive institutionalization of partnership working through Farm Herefordshire therefore became politically desired and financially supported, even though neither of the partners actually had a *‘particular desire to set up another organisation’* (FH member, 15 November 2016). This was not because any of the partners was opposed to further collaboration or to the participation of additional government bodies, but because they saw the main problem in the organizational fragmentation of advice to the farming community.

‘...[F]armers here are faced with an absolute plethora of initiatives and sort of legal requirements and they were clearly getting submerged by all of this. And the last thing we wanted to do was to launch another initiative. So Farm Herefordshire was not intended to be a separate organisation. It was a way of coordinating what we all did and it didn't really matter which of us carried the messages as long as the messages were being carried.’ (Ibid).

This fragmentation of advice in the UK had traditionally been associated with the privatization of public extension services (Curry and Winter, 2000; Klerkx and Proctor, 2013), which appears to have introduced unprecedented levels of complexity for farmers as well as for those who seek to govern. The *‘plethora of initiatives’*, for example has not only become overwhelming, but also contradictory at times, as different actors were giving differing advice to farmers. This is particularly problematic in the context of nutrient recommendations and most obvious in the case of the

Nutrient Management Guide RB209 of the Agriculture & Horticulture Development Board [AHDB]. This document has for a long time recommended much higher phosphate application rates than what many agronomists, conservationists and farmers felt necessary based on their experience and actual plant-nutrient requirements. Through the formation of Farm Herefordshire and the enrolment of key actors such as the AHDB, the partnership seeks to avoid such contradictions and to create order in an increasingly diverse agri-environmental governance context. As such, Farm Herefordshire represents a collective approach that aims to orchestrate the partners' individual advice *'to ensure consistent messaging'* on the phosphate problem (Farm Herefordshire, n.d.). This issue represents a common concern and determined the initial remit of Farm Herefordshire, which is directed at instigating behavioural change among farmers. While this ultimate objective, as well as the involvement of additional government bodies, may be understood as having added a top-down twist to the nature of the partnership, such simplifications based on binary distinctions (i.e. top-down vs. bottom-up) add little to our understanding about the genesis of partnership working in this case. In fact, Farm Herefordshire is a perfect example of the interrelations between such binaries, which have contributed to its ongoing and open-ended development. This is furthermore evidenced by the fact that Farm Herefordshire has become subsumed under the Wye Catchment Partnership, which stretches across various administrative boundaries and which has brought several dozen additional institutional and individual members together *'with a shared common goal of protecting and enhancing our rivers, landscape, habitats and wildlife'* (see: <http://wyecatchment.org>). The work of Farm Herefordshire must therefore also be seen in relation to this wider partnership, in the sense that negotiations and interactions in both fora constantly inform each other.

3.5 Exploring the co-products of Farm Herefordshire

The background story in Section 4 revealed the politicisation of the nutrient pollution problem which has led to a formalized mode of collaborative action in the county of Herefordshire. Yet, what does this formalized partnership work look like in actual practice? How do the partners of Farm Herefordshire manage to align their agendas and orchestrate their actions? How do they ensure that their collective messages on the phosphate issue are being heard? In this section, I will turn to these questions by attending to the four instruments of co-production set out in Section 3.2. By exploring

the everyday practices of partnership working we will be able to see more clearly how identities, institutions, discourses and representations are jointly being made. Although the subsequent analysis is tackling one instrument at a time, it should be noted that their nature is of course interrelated and overlapping.

3.5.1 Building a collective identity: The premises of neutrality and unity

Despite collegial exchange and genuine commitment to collaborate on the phosphate issue balancing different opinions and organizational politics became critical from the very beginning when the partners had to agree on what the partnership was actually meant to do. This collective identity building was a lengthy process involving many careful decisions. For example, the nomination of the director of the Brightspace Foundation to act as the chairperson of the partnership was one of these decisions as he recalled:

‘There were a lot of politics involved in that. And one of the reasons why we chair Farm Herefordshire is that we are in a way the honest broker in the midst. We do work with farmers..., but we tend to work primarily with orchard owners. So we have a track record in the land-based economy, but we were not a membership organisation and we’re not there to promote a particular issue like fishing,... or enforcement ...so we ended up being the sort of gate keeper and the partners agreed that we would be the accountable body for any funding.’ (FH member, 15 November 2016).

As a non-profit organization, the Brightspace Foundation once belonged to the well-known Hereford-based cider maker Bulmers, but nowadays operates independently and broadly advocates sustainable development within the county through collaboration, open data and local solutions. Given its “non-conflicting” background all other partners saw it best positioned to help relieve any political tensions that were likely to arise by trying to gather different interests and personalities around the same table.

An equally careful decision was made about the branding of the partnership. For the choice of the logo the partners considered it important to demonstrate that *‘Farm Herefordshire has no baggage’* (FH member, 6 July 2017). The logo was inspired by the place branding used by local county authorities including the tourism and business board (Figure 8a). The Herefordshire master logo contains the iconic Hereford bull and with its tagline **‘Herefordshire you can’** (emphasis in original) plays on the famous slogan used by the Obama campaign team in the 2008 US presidential elections.



Figure 8: (a) Place branding logo of Herefordshire county; (b) the modified logo of Farm Herefordshire

Source: (a) <https://www.hereyoucan.co.uk>; (b) <https://www.wyeuskfoundation.org/farm-herefordshire>.

Slightly re-arranged to reflect the desired neutrality of *'Farm Herefordshire'* (emphasis in original) the logo neither directly discloses any of the involved partners, nor does it allude to the negative phosphate problem (Figure 8b). Instead, it conveys the impression of a collective identity around a common place of farming and belonging by drawing on the agricultural heritage within the county. Thus, the members of Farm Herefordshire felt it was important to camouflage the individual organization's interests and reputations by choosing a logo that was perceived to be less biased than say, for instance, the fish or badger depicted on the logos of the environmental charity groups (see Table 5 in Section 3.4.1). On one side this is based on the realization that each partner's ability to engage with farmers – and therefore to contribute to the overall success of Farm Herefordshire – remains constrained by their own reputations and capacities. On the other side this also demonstrates a growing recognition among the partners that complex agri-environmental problems such as diffuse pollution can only be solved by loosening the straitjackets of existing organizations. Accordingly, all partners regularly emphasized in the steering group meetings – as well as in the Wye Catchment Partnership meetings – the need for sharing information and data and for de-siloing knowledge in order

'[to get] everybody to work together, to bring their resource to the table, be it money or skill or what have you and to leave all the badges at the door [...]. Farm Herefordshire is that badge and we work underneath it.' (FH member, 30 January 2017)

This implies that identities also need – and indeed begin – to change on the organizational level of the involved partners and not only on the farm level itself (Inman et al., 2018). This commitment affords that one-sided interests necessarily

have to step back behind the shared objective, which is obviously not easily achieved. However, in return this unity holds the potential to bridge the fragmentation of mitigation advice and helps to strengthen *‘the credibility of the message content’* (Blackstock et al., 2010, p. 5635), which remains a major challenge within a sector that tends to downplay its negative environmental impact in general (Silvasti, 2003a), and particularly with respect to water resources (Blackstock et al., 2010).

Thus, what might appear at first as a potential de-politicisation of the problem matter, is actually far from it. The premises of neutrality and unity rather constitute a pragmatic attempt to make headway in a field that has traditionally been much more divided and resistant to change – not least due to competing demands and interests.

3.5.2 Agreeing on joint institutions: The role of agenda-setters and the testing of boundaries

In practice this new organizational demand means *‘a lot of time talking about things that appear to be quite (...hm...) miniscule like the wording on the leaflet’* (FH member, 15 November 2016), which contains the diffuse pollution mitigation measures that Farm Herefordshire promotes to farmers (Figure 9). In this context the influential role of agenda setters, who have the capacity to steer the partnership in specific directions, becomes apparent. Here, one representative of an environmental charity group stands out who not only acts as a knowledge broker, but also as a diplomat who is capable of traversing different working cultures, mediating confrontational situations, and translating new scientific insights into more colloquial parlance. This key person, called Ella¹⁶, was raised on a farm, had previously worked for a governmental partner organization, and had recently conducted a farming-industry sponsored study on re-engaging farmers with their soils. On one hand such people skills are appreciated by the other partners for they help to overcome inter-organizational tensions that previously existed:

‘The [name of member organization] has been a very, very interesting scenario, cause you know there’s quite strong characters there and ...erm..[a specific activity] is obviously their top game, which doesn’t actually often lie necessarily with, you know, some of the other side of things, but...Ella’s brilliant, she is absolutely fantastic, so I think she’s made a huge difference, you know to that organisation,... trying to get rid of the tensions.’ (FH member, 30 January 2017)

¹⁶ Pseudonyms are used throughout this paper to protect the identity of all research participants.

Ella's personal interest in soil health has also been instrumental in bringing this topic to the partnership table and in aligning it with the phosphate problem. With at least three out of the seven mitigation measures directly related to soil health (i.e. 'soil cover maintained'; 'good soil structure'; 'healthy organic matter levels'), it has in fact become institutionalized within the specific land management practices promoted by the partnership.



Figure 9: The specific farming practices promoted by Farm Herefordshire.

Source: Farm Herefordshire leaflet

More controversial than the unifying topic of soil remained the question whether or not all livestock should be fenced off from watercourses to prevent riverbank erosion and water contamination from livestock poaching¹⁷ and defecation. This other “best practice” was demanded by several partners but opposed by a farming industry representative, which explains the vague formulation of ‘*proactive stock management*’. Examples like this show that the outcomes of the steering group discussions are always compromises that reflect the partners’ standpoints gained

¹⁷ Livestock poaching ‘is the name for damage done to grass and the underlying soil when it is tremped by livestock in wet conditions’ (AHDB Beef & Lamb, 2016, p. 12).

through their specific work experiences, commitments and convictions, but also their willingness to make concessions. After all, fencing-off livestock from watercourses is not off the agenda. It has been carefully rephrased and left to the discretion of each partner to interpret its meaning. Thus, leaving all the badges at the door does not eliminate different viewpoints, but the steering group certainly provides a space for more open discussions that allow the testing of boundaries.

The testing of boundaries becomes even more apparent with the partnership's maturation and its discussions moving beyond the original remit of phosphate reductions. For example, over the course of this research further common ground was explored on the use of glyphosate, the importance of biodiversity and the role of the agri-food industry. The first topic was raised by the chairperson of the partnership with the intention to provide farmers with a joint recommendation about alternatives shortly before the EU decided to prolong the license for this herbicide. While this suggestion was welcomed in principle, both the National Farmers Union and the Environment Agency representatives were unable to commit to this idea due to a national NFU campaign running in parallel in support of glyphosate, and on the grounds of political neutrality on part of the EA, respectively. Full support on the other hand received the idea to retain the advice on biodiversity provided by the Campaign for the Farmed Environment, who was confronted with budget cuts. This decision allowed the group to demonstrate their solidarity with another partner organization and showed their appreciation to act upon issues that are related to diffuse pollution. Wider engagement with the agri-food industry on the other hand came into play as a potential solution to secure core-funding for the partnership itself. Although the EA representatives had provided initial start-up funding for Farm Herefordshire by juggling different pots of money around, they regularly made clear that a long-term solution was needed. Thus, bringing in corporate money was discussed on several occasions as well as the idea to register a trademark for Farm Herefordshire that could potentially culminate in a marketable food label. Such insights show the organic and open-ended nature of Farm Herefordshire. Despite pre-defined agendas that everyone brings to the table there seems to be room for further explorations, which may as well add to the future scope of the partnership and the repertoire of jointly agreed institutions.

3.5.3 Making representations with the help of the “good guys”

In conjunction with the making of a collective identity and shared institutions we can observe the co-production of representations. This is most obvious on the farm level where the partnership’s messages and joint actions try to redefine what constitutes good agri-environmental practice within the county. For this the protagonists of Farm Herefordshire actively link and augment the cultural concept of the good farmer (Burton, 2004; Silvasti, 2003b) with the agri-environmental measures and technologies that have been recognized by the partners as appropriate to redress the phosphate problem.

Farm walks – the first pillar in the engagement strategy of the partnership – are vital in this context because they allow the partners to demonstrate how good practice looks in real-life settings (see also Blackstock et al., 2010).¹⁸ These free and public events are either organized separately as Farm Herefordshire farm walks or “piggy-backed” onto one of the partners’ otherwise planned on-farm activities. Most importantly they are hosted on farms which are considered by the partners as examples of “best practice” within the county. The protagonists are recruited through the partners’ own network, with most of them belonging to a loosely organized group of farmers who already share an interest in more sustainable land management. This informal group has already existed before the launch of Farm Herefordshire, but now serves the explicit purpose of coordinating the work of the partnership with the local farming community. Joint suppers with this group of farmers were organized twice a year during which the members of Farm Herefordshire sought feedback and legitimacy for their messages and future course of action.

The farm walks as such seek to combine a farmer-led approach to knowledge transfer with expert-advice from the involved organizations. Some observations from one of these events help illustrate their character: For example, a well-attended meeting took place near Kington on Tuesday the 24th of January 2017 attracting more than 50 participants including farmers, farm advisers, and local residents. Following the usual procedure, the Rural Hub Herefordshire had advertised the event in its monthly newsletter which reaches more than 1700 recipients. The event was hosted by the Evans family, who run a mixed farm that is partly certified organic, and who had previously sought environmental advice from the Wye & Usk Foundation. After complimentary tea/coffee and a short welcome speech by the farmer and his

¹⁸ Such on-farm demonstration events have allowed Farm Herefordshire to engage with around 500 farmers during the first two years of the initiative.

son, two facilitators – one from the Wye & Usk Foundation and one from NE – took over and invited the audience to join them on a farm walk to *‘find out how good soil management can help to boost profitability and health of your cattle and sheep’* (Farm Herefordshire event leaflet n.d.). The walk lasted for about two hours and included several thematic stops during which the two facilitators actively tried to engage the audience in discussions around the Evans family’s farming practices. This covered their accurate application of fertilizer and use of soil testing, their careful management of soil structure and biology for profitable grassland, their strategy to maximize the quality and quantity of forage production, as well as their responsible wormer use for healthy soil invertebrates and mineral balance in livestock.¹⁹



Figure 10: Participants take soil samples to assess the health of soils during a farm walk organised by Farm Herefordshire.

Source: Author

To support and validate the benefits of the host’s good land management practices the facilitators stepped in and drew on some of the earlier mentioned people skills to mediate and further inform the discussions (e.g. by explaining scientific terms and new insights in “farmer speak”). Moreover, they also relied on a sensual engagement

¹⁹ The discussions around the last two topics were facilitated by a local veterinarian who was invited to the event by the organizers. This underlines the partnerships commitment to collaborate with like-minded actors.

with the problems and solutions at hand. Thus, taking a spade, digging a hole, feeling the soil structure, and counting the worms were integral parts of each of these farm walks (Figure 10). This was done to re-engage farmers with their soil, to strengthen their attentiveness and appreciation for soil organisms and functions (Krzywoszynska, 2019), and to convince them of the need to conduct regular soil tests to avoid over-fertilization and by association further phosphate pollution. This emphasis on a direct engagement with soil is noteworthy because tactile encounters are important for knowledge about more sustainable farming practices to become embodied (e.g. Carolan, 2011, 2008, 2007). In fact, as Vankeerberghen and Stassart (2016, p. 397) suggest hands-on engagement like this *‘leads to a cognitive detachment from seeing the soil as a “substrate” to seeing it as “living soil”’*.

This attempt to re-make what it means to be a good farmer is noteworthy for two reasons: First, it shows that its defining values and principles are never exclusively negotiated between farmers, but within wider networks of actors, which reflect the changing interest in and expectations of agriculture (see also Burton et al., 2020). Importantly, non-farming actors – such as in this case government agencies, environmental charity groups or industry bodies – equally subscribe to re-negotiated versions of a good farmer in order to accommodate their range of (changing) values with the farming sector. Second, it clearly constitutes an attempt to construct regional or place-based versions of the good farmer by creating attachment and responsibility to familiar and (under)valued landscape features such as the river Wye or farmers’ own soils. As such this supports the *‘emerging recognition that subjectivities associated with the “good farmer” concept are subject to spatial, contextual and temporal shifts and contestations’* (Wheeler et al., 2018, p. 667).

3.5.4 Reconciling contested discourses: The promise of “Eco-productivism”

What all the “good farmers”, who collaborate with Farm Herefordshire, have in common is that they are very well connected to one or more of the partner organisations. They are early adopters of the promoted land management practices. They are keen to host and showcase their business and farming practices, and they are confident to speak in front of a live audience or a video camera, no matter if their background is in mixed farming, arable, organic, conventional, no-till, large-scale estate or smaller-scale family farming. This range of good farmer’s profiles is useful as it helps the partners to target and speak to the wide spectrum of farming within the

county. *‘The good guys [who] are doing it anyway’* (Wheeler et al., 2018) therefore also play a key role in the best practice videos,²⁰ which form the second pillar of Farm Herefordshire’s engagement strategy. Each of these videos is dedicated to one of the aforementioned good agri-environmental practices and follows a similar storyline. The scenes capture an interview situation between a Farm Herefordshire representative and a selected farmer who talks about his personal experiences with one of the promoted practices.

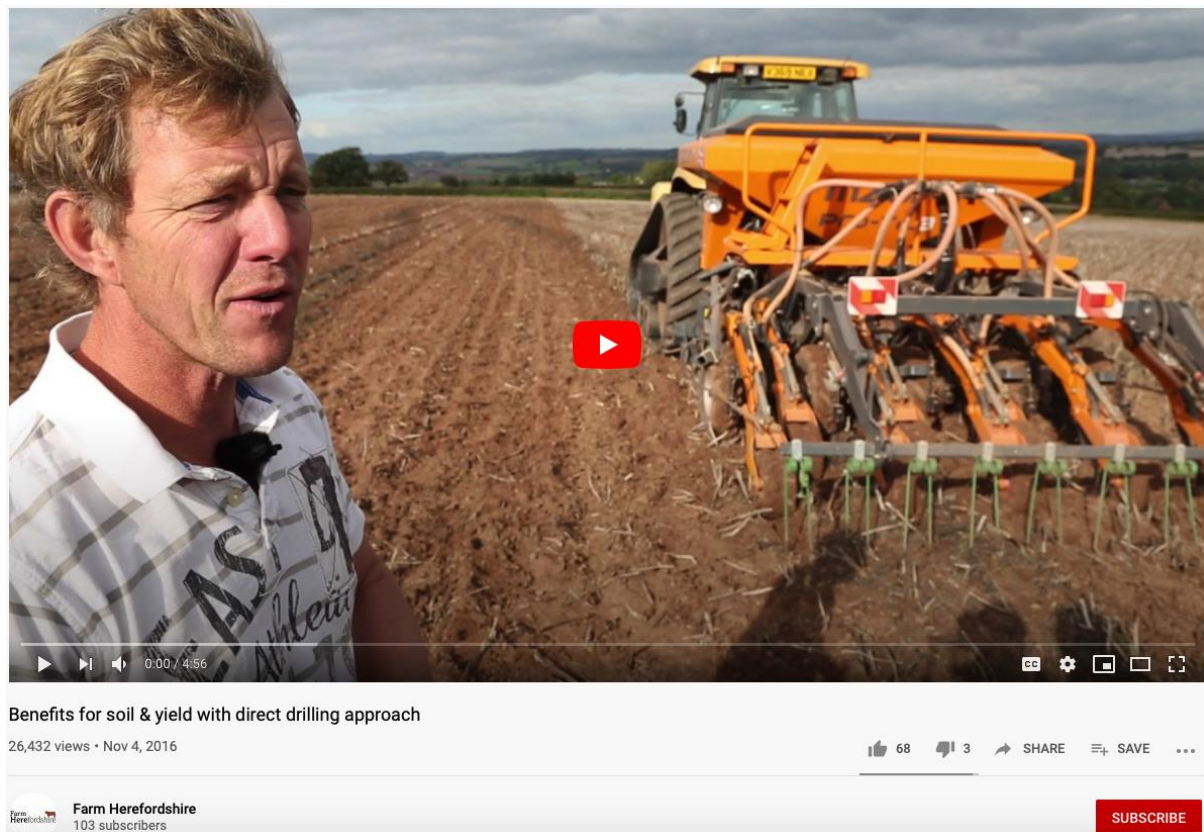


Figure 11: Screenshot of Farm Herefordshire YouTube video, showing John in front of his Mizuri strip-till drill.

Source: <https://youtu.be/XBdruGJzkYA>

In the most frequently watched video on YouTube,²¹ John Joseph, an arable farmer from South Herefordshire, talks about the benefits of conservation tillage for soil health and yields (Figure 11). According to John, the soils on his farm were *‘farmed out’* when he took over the land, and he even once had *‘watched the soils washed*

²⁰ The main motivation behind these videos was to reach a larger audience, especially those local farmers who would never show up at a physical meeting. It remains questionable though whether or not these farmers would access Youtube videos instead.

²¹ With more than twenty-six thousand views since November 2016 this is the most frequently watched video on the YouTube channel of Farm Herefordshire.

down the village all summer long’ when he rented out his land to a potato grower. What stands out in his video statements is that even though other farmers mismanaged John’s soils he assumes the collective responsibility for the *‘damage we were doing to the soils with continuous cultivations, mineralization and nitrogen and the release of the carbon’* (emphasis by the author), which eventually convinced him to do *‘something different’*. For him this difference lay in *‘switch[ing] over to the Mizuri system [strip tillage] after the wet year of 2012.’* Since then he is *‘trying not to drive on the land at all other than ... when it’s essential’* – and this new strategy pays off in terms of *‘savings’*, the desired *‘crumb structure’* of the soil, and higher yields contrary to his own expectations as well as those of his peers.

First-hand accounts such as this one show how a differentiated understanding about soil can serve as a tipping point towards conservation agriculture (Vankeerberghen and Stassart, 2016). And moreover, it helps the involved actors to dismantle oppositions between productivity on one hand and environmental conservation on the other, by emphasizing their synergies and by constructing a narrative around efficiency gains. The emphasis on profitability was a common denominator that interestingly enough was not only important to the farming industry associations, but equally so to the environmental charity groups. The latter have long realized the potential that a narrative around profitability holds as an entry-door to the fields and minds of farmers.²² Thus, as much as stories like this demonstrate the fundamental importance of healthy soils for agricultural production, farmers can make savings and improve their business results when they adopt better land management practices and novel technologies. In the end this shall demonstrate that the problem of diffuse pollution can be solved without adversely affecting farmers’ incomes; indeed, farmers like John shall show how farming “greener” can keep – or put farmers – in the black.

This constructed reconciliation of previously contested discourses suggests that farmers are no longer expected to uphold different values simultaneously (Emery, 2014, 2010), but to recognize their mutually constitutive character. Thus as in the case of similar collaborative initiatives elsewhere, farmers’ *‘productivist and conservationist identity standards [are] moving toward congruence’* (McGuire et al.,

²² Farm advisers of the Wye & Usk Foundation, in particular, resorted to this narrative when providing free and confidential advice during farm visits. In both face-to-face communication and their final farm reports they emphasized the potential economic benefits to be gained by farmers when they chose to implement various conservation recommendations.

2013, p. 66). I would posit that this congruence signals the much needed turn away from ecological simplification – which has been so fundamental for the rise of productivist agri-food systems (Iles et al., 2017) – towards something that we could call “eco-productivism” (see also Griffon, 2013). Eco-productivism in this context lies somewhere in-between other powerful but potentially dividing concepts and ideas – such as organic vs. conventional, agro-ecology vs. sustainable intensification, land sparing vs. land sharing – and thereby perfectly reflects the non-confrontative and pragmatic nature of working in partnership for better land management practices.

3.6 Conclusion: A hopeful appraisal of partnership working

This article has told the story of Farm Herefordshire – a local partnership initiative that raises awareness about agricultural diffuse pollution on the English side of the river Wye. One of the article’s contributions to the literature lies in the use of ethnographic research methods which has allowed me to look beneath the surface of the partnership approach in agri-environmental governance and to uncover some of its everyday aspects and meanings for those actors who are directly involved. The study has revealed that partnerships like Farm Herefordshire build on a long history of inter-professional relationships that have developed in response to the fragmentation of agri-environmental advice to the farming sector. This common history has created trust among the partner organisations and contributed to better coordination, but it has also shaped, and to some degree pre-determined, the scope, membership structure and ways of more formal partnership working. Studying this phenomenon with some of the organisations involved has also shown that day-to-day partnership activities can be cumbersome and mundane. Building a partnership, agreeing on its scope, its key messages and actions requires a lot of time for meetings, discussions, and consensus building. Diplomacy is key here, but this is fraught with compromises which often reflect the lowest common denominator. Nevertheless, these laborious and long-winded processes which are inherent to partnership working allow agenda-setters to make their mark on the partnership and by doing so test new and potentially more progressive common ground. These mundanities of partnership working rarely enter the limelight of research studies, but as this paper has shown they are essential to the functioning of such initiatives.

The second contribution of this paper lies in utilising Jasanoff’s idiom of co-production which has allowed me to document and account for the less tangible, but

very powerful dimensions that Farm Herefordshire is trying to rework. The partners actively nudge farmers towards better land management practices via their attempts to re-shape identities, institutions, representations, and discourses. The nature of any of these four instruments is rigid and difficult to change, which makes the concerted efforts of the partnership noteworthy and critical. Here in this context these concerted efforts involved the partners' careful framing of the phosphate pollution problem and how they made it appear less political by emphasizing the premises of neutrality and unity. Such efforts involved the negotiations and compromises that the partners had to make about acceptable land management behaviour which qualifies certain practices over others. The concerted efforts also became visible in the representations made about good farming in Herefordshire. These representations became more powerful through the enrolment of the "good guys" who have acted as ambassadors and peer-to-peer communicators of good practice and allowed the Farm Herefordshire partnership to appeal to farmer's self-accountability and a shared sense of place that is worth protecting. Lastly, the partnership's attempts to change dominant discourses became clear in the formation of a common language which has allowed the partners to speak about and act upon the phosphate problem in an authoritative way. In this common language certain storylines and technologies have become aligned in such a way that tackling diffuse pollution not only seems possible, but actually makes perfect economic sense to any farming business. All of this demonstrates the many frontiers that this partnership is working on simultaneously, as well as the collective effort and hard work that is necessary to create common ground for incremental, but broad-based change.

As such partnerships like Farm Herefordshire are certainly no silver bullet (McAllister and Taylor, 2015) which are able to solve complex agri-environmental problems or fundamentally transform power relations that govern agri-food systems. But at least in this case the analysis clearly demonstrates that the partnership approach does not aim to sustain the status quo as suggested by other commentators (e.g. Blühdorn and Deflorian, 2019). Farm Herefordshire represents a soft, non-confrontative and pragmatic approach to working with the mainstream farming system, and it is exactly here where much of its value lies. The partnership shows a clear ambition to raise awareness about the phosphate issue and about better land management practices by targeting the entire 'farming community' of Herefordshire including 'the hard to reach'. To that end Farm Herefordshire has been

successful as the partners managed to engage with almost 500 farmers during the first two years of the initiative, which represents almost a quarter of the county's registered farm businesses. The partnership activities have also supported the partner organisations with the delivery of their individual work streams – be that in terms of increasing the length of riverside fencing or concreting farmyards to avoid run-off. Even though it is impossible to clearly attribute the contribution that Farm Herefordshire has had on these activities due to the partner organisations' multiple work streams and sources of funding, it is these small steps and successes which show that partnership working is not powerless, but indeed able to contribute to changing social-ecological orders on the local level and in the material environment.

Whilst this study provided insights into some of the everyday aspects and dynamics of partnerships working, future research studies should consider longitudinal evaluations of partnership working to further establish the direct and contributing factors on engendering behavioural change on the farm level. The level of fragmentation of farmers advice is also likely to differ in other national contexts and so are the reasons and justifications for the use and establishment of partnership working not necessarily the same elsewhere. Therefore, comparative insights from other national contexts could help inform the evidence base of partnership working.

Chapter 4 – Social (un-)learning and the legitimization of marginalized knowledge: How a new community of practice tries to ‘kick the grain habit’ in ruminant livestock farming

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Abstract: This paper presents a qualitative case study analysis of the Pasture-Fed Livestock Association [PFLA], which seeks to ‘kick the grain habit’ in ruminant farming by promoting and certifying purely pasture-fed production systems. Reading through a social learning perspective, the article first traces back how this association has become established as a new and distinct community of practice [CoP]. This entails attending to the process of forming a *joint enterprise*, the spaces that allow for *mutual engagement* between its members, and the *shared repertoire* that has been built over time. Thus, the paper draws on the three key characteristics of Jean Lave and Etienne Wenger’s (1991) conceptualization of communities of practice, which have become widely recognized for providing effective fora for learning and knowledge management, as well as for spurring innovations. More precisely, the paper connects with earlier works invoking this concept within agri-food studies and specifically seeks to contribute to the debates raised around the forms of knowledge that are shared within such communities and their members’ means of interaction that facilitate social learning. Secondly, and in direct relation to this theoretical framing, the paper makes an attempt to refine understandings of social learning. While this remains predominately associated with the acquisition of new knowledge, skills or technologies, the paper argues for a dialectical perspective, which pays equal attention to how people break with past practices. In other words, the paper highlights the role that unlearning plays within new CoPs such as the PFLA. Lastly, the paper explores the wider knowledge networks that are forged as the community matures and seeks to disseminate and legitimize its knowledge beyond its own boundaries. The empirical material of this case study will be useful to inform debates about the potential role that new CoPs can play in bringing marginalized practices, knowledges, and products to peoples’ minds and markets.

Keywords: Community of practice; livestock farming; social learning; unlearning; knowledge; legitimacy

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4.1 Introduction

David Brédart and Pierre Stassart recently made a noteworthy contribution to this journal by showing how the withdrawal of concentrated feeds in livestock farming can serve as an *‘opportunity for farmers to change their relationship with the soil, plants, animals, and other human beings’* (Brédart and Stassart, 2017, p. 1). Their study describes the learning trajectory of a Belgian livestock farmer towards feed autonomy and provides a corrective to more dominant conceptualizations about agricultural transitions. Rather than linear or sequential (Hill and MacRae, 1996; Wilson, 2008), the learning process of their “pioneer farmer” turned out to be much more messy and complex (see also Lamine, 2011). People he had met or events he chose to attend inspired him to experiment with new ideas on his own farm in a trial and error fashion. Importantly, this stimulated an internal dialogue between himself and his own farming practices and resulted in constant tinkering and readjustments.

This article builds upon these insights but shifts the focus away from the individual to the collective learning dynamics of a group of like-minded farmers and supporters in the UK. The UK provides a particularly interesting context because here feed autonomy is on its way to become more than *‘an umbrella for a set of diffuse and rather informal transition strategies’* (Brédart and Stassart, 2017, p. 11). In fact, contrary to Belgium where *‘feed autonomy is not a practice that is codified by terms of reference and overseen by a certifying body’* and therefore also *‘not part of a normative conversion approach’* (Ibid.), exactly this appears to be the case in the UK. Here, the Pasture-Fed Livestock Association [PFLA] addresses the debate about the unsustainability of livestock farming. One particular concern constitutes the increasing competition between feed grown for animals versus food grown for direct human consumption (Eisler et al., 2014; Mottet et al., 2017). With its associated Pasture for Life food label the PFLA seeks to *‘kick the “grain habit”’* (PFLA, 2016a, p. i) in ruminant farming and thereby challenges industry norms and trends, which see a decline in grazing and an increase in concentrated feeds (Plant, 2018; Shortall, 2019). Its members have agreed upon a set of UK-wide standards for pasture-fed beef, sheep, lamb and dairy, which prohibit the use of concentrated feeds and stipulate that *‘grass and forage must be the [only] feed source consumed for the lifetime of the animal’* (PFLA, 2016b, p. 16). This is justified on the grounds of achieving a distinct product quality that is conducive – rather than harmful – to

human health, benefiting the welfare of ruminant animals, and ensuring a number of environmental advantages.²³

The objective of this paper is to contribute to a better understanding of how transitions towards more sustainable livestock systems can be initiated through social learning and collective action. First, this implies to trace back how the PFLA has become established as a new and distinct community of practice [CoP]. It entails attending to (i) the process of forming a *joint enterprise*, (ii) the spaces that allow for *mutual engagement* between its members, and (iii) the *shared repertoire* that has been built over time. Thus, the paper draws on the three key characteristics of CoPs (Lave and Wenger, 1991; Wenger, 1999), which have become widely recognized for providing effective fora for learning and knowledge management, as well as for spurring innovations (Brown and Duguid, 1991; Hildreth and Kimble, 2004; Wenger et al., 2002). More precisely, the paper connects with earlier works invoking this concept within agri-food studies (Carolan, 2011; Crowley et al., 2018; Dolinska and D'Aquino, 2016; Goulet, 2013; Materia et al., 2015; Morgan, 2011; Oreszczyn et al., 2010; Triste et al., 2018), and specifically seeks to contribute to the debates raised around the forms of knowledge that are shared within such communities and their members' means of interaction which facilitate social learning. Second, and in direct relation to this theoretical framing, this paper makes an attempt to refine understandings of social learning in the context of agriculture and food systems. While learning in this field remains predominately associated with the acquisition of new knowledge, skills, or technologies, the paper argues for a dialectical perspective which pays equal attention to how people break with past practices. In other words, the paper highlights the role that unlearning plays within new CoPs such as the PFLA. Lastly, the paper explores the wider knowledge networks that are forged as the community matures and seeks to legitimize its co-constructed knowledge beyond its own boundaries. The empirical material of this case study provides rich insights in these respects and will be useful to inform debates about the potential role that new CoPs can play in bringing marginalized practices, knowledges, and products to peoples' minds and markets.

²³ For an overview about the benefits associated with pasture-based livestock production systems see: <https://www.pastureforlife.org/research/>

4.2 Communities of practice, knowledge sharing and the notions of unlearning and legitimacy

4.2.1 Communities of practice

Put simply, *'communities of practice are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis'* (Wenger et al., 2002, p. 4). The concept has its origins in learning theory and was first developed by social anthropologist Jean Lave and educational theorist Etienne Wenger (1991). It originally builds on ethnographic observations from a variety of apprenticeship studies, which showed *'that apprentices learn mostly in relation with other apprentices'* and through *'engaging in practice'* (Lave and Wenger, 1991, p. 93) – no matter if the apprentices learned how to become midwives, tailors, naval quartermasters, butchers or non-drinking alcoholics. Thus, in contrast to conventional learning theory, which largely conceives of learning as an individual, separable, hierarchical, and abstract undertaking, Lave and Wenger were able to demonstrate that more effective learning takes place through participation in social groups that encourage learning through belonging, becoming, experiencing, and doing (see also Wenger, 1999). Such *'situated learning'* (Lave and Wenger, 1991) is characterized by three dimensions that are essential to any CoP. They include:

- the possibility to negotiate and pursue a **joint enterprise** such as a common concern or a problem;
- **mutual engagement**, or the means and ways that allow community members to interact on a regular basis and to build meaningful relationships; and
- the development of a **shared repertoire** consisting of *'routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions, or concepts that the community has produced or adopted [...], and which have become part of its practice'* (Wenger, 1999, p. 73).

This socio-relational re-conceptualization of learning has ever since attracted the attention of a variety of research fields including agri-food studies, where it was mostly discussed in relation to how farmers learn about more sustainable food production practices. Morgan (2011), for example, explicitly tested the merits of this concept by exploring social learning within different groups of organic farmers in Wales. He found that *'farmers associate and engage in social learning more readily with peers determined by similar attitudes to farm business, farming styles and understanding of what organic agriculture entails'* (Morgan, 2011, p. 99).

This was also the case in Carolan's (2011) study of small-scale, market-oriented agriculture(s) in the US. Mutual beliefs and assumptions allowed his protagonists to speak the same language, to build relationships with each other and to learn from one another through the sharing of experiences and knowledge. Similar insights also derive from studies about CoPs within the artisanal cheese sector in Ireland (Crowley et al., 2018), sustainable dairy farming in Northern Ireland and the Netherlands (Triste et al., 2018), but also from large-scale commodity growers involved in natural resource management in Sweden (Nykvist, 2014), or GMO crop trials in the UK (Oreszczyn et al., 2010).

4.2.2 Knowledge sharing within CoPs

The application of this concept to such diverse agri-food contexts – including potentially opposing visions of sustainable transitions (Marsden, 2016) – stands exemplary for a broader shift of interest that has moved away from linear models of knowledge transfer towards understanding, and indeed promoting, peer-to-peer knowledge exchange via distinct groups, networks, or projects (Blackstock et al., 2010; Klerkx and Proctor, 2013; Moschitz et al., 2015). At the heart of this paradigm shift rest assumptions and expectations that *'emphasise the need for people to develop their own solutions to problems'* through the co-production of knowledge (Blackstock et al., 2010, p. 5633). CoPs are appealing in this context, because they promise participation, mutuality, and trust, which are particularly conducive for informal and practice-based learning as well as for sharing tacit knowledge. In contrast to explicit knowledge, tacit knowledge *'is rather difficult to explain or express, as it encompasses both farmer's skills and crafts and his mental models, ideals and values'* (Triste et al., 2018, p. 1428). In other words *'we know more than we can tell'* (Polanyi, 1966, p. 4), and therefore tacit knowledge tends to stick with people, is embodied, and sometimes more-than-representational (Carolan, 2011, 2008).

How such sticky knowledge is made available within CoPs constitutes a key concern within the literature (Carolan, 2011; Goulet, 2013), as several commentators maintain that the diffusion of more sustainable farming practices hinges on such holistic and locally embedded knowledge (Šūmane et al., 2018; Triste et al., 2018). Triste et al. (2018) contend that it either becomes available through socialization (e.g. through practice, observation, situated learning) or through externalization (i.e.

converting tacit into explicit knowledge) (see also Hoffmann et al., 2007). However, these processes should not be seen as separate from each other but intrinsically linked, because *‘only by first spreading the practice in relation to which the explicit makes sense is the circulation of explicit knowledge worthwhile’* (Brown and Duguid 2001, in Carolan, 2011, p. 131). The means of communication within CoPs and the spatial proximity between its members are therefore considered to be critical. Carolan (2011), for instance, maintains that face-to-face and tactile encounters between members of a CoP facilitate the exchange of sticky knowledge, whereas more distanced means such as web-based communication do not represent an adequate substitute. This leads him to distinguish between spatially proximate interactions within CoPs that produce embodied knowledge and networks of practice (see Brown and Duguid, 2001) that mostly operate indirectly *‘and produce little knowledge’* (Baalen et al., 2005 cited in Carolan 2011, p. 136). To some extent, this also reaffirms the image of the internet-adverse farmer, but keen experiential learner as echoed by the study of Oreszczyn et al. (2010).

However, rather than providing clear delimitations in term of depth and quality of social learning, non-virtual and virtual interactions can also be complementary and thus fruitfully combined to bridge the spatial disconnectedness of dispersed CoPs (Materia et al., 2015). This is particularly relevant in the field of agriculture, where the organizational framework is fragmented and weak (Materia et al., 2015; Oreszczyn et al., 2010), and where the CoPs concept is increasingly proposed as an intervention tool to counter this development in order to empower farmers (Dolinska and D’Aquino, 2016; Morgan, 2011).

4.2.3 The notions of unlearning and legitimacy

One aspect that remains absent in debates about CoPs is the idea that farmers do not only engage in social learning to acquire or adopt new knowledge, skills or technologies, but also to distance themselves or even break with past practices, routines, and beliefs. This absence is not surprising because *‘the notion of unlearning appears counterintuitive’* (Pedler and Hsu, 2014, p. 298). It is not positively charged as the concept of learning (Ibid.), and yet it can be equally transformative as Lave and Wenger have implicitly demonstrated themselves in their empirical work on *‘becoming a nondrinking alcoholic through Alcoholics Anonymous’* (Lave and Wenger, 1991, p. 79). To be clear, I do not want to compare alcoholism to farming,

but certain dependencies on unsustainable practices are indisputable and perhaps they can be more easily overcome through collective unlearning within new CoPs.

Unlearning as a concept derives from organizational theory and was recently introduced to environmental studies. Herein, it was primarily applied to wicked problems²⁴ and described as *‘an essential phase in reaching transformation because it makes space for learning’* (Nygren et al., 2017, p. 474). Although this suggests a rather mechanistic understanding – one in which old knowledge first needs to be intentionally discarded, before new learning can set in – others see it as a parallel process (Becker, 2005), that holds radical potential. Drawing on Chokr (2009), Pedler and Hsu (2014, p. 297) state:

‘Combining this with the Foucauldian understanding of power and knowledge enables a more radical view of unlearning as a capacity which encourages individuals to be reflexive of themselves as socially constructed entities within relations of power, and which inspires knowledges that are currently marginalized or repressed.’

Thus, unlearning holds the potential to recognize prevailing power relations and consequently engage in a conscious re-shaping of the dominant discourse through collective action: sharing their knowledge not only internally, but also beyond the boundaries of the CoP with strategically chosen representatives of the dominant knowledge regime may provide opportunities to de-marginalize and legitimize the community’s knowledge. As Rossi and colleagues (2019, p. 149) recently pointed out: *‘Legitimacy, embedded in social structures, is at the basis of actors’ discursive power and reframing ability’*; it is *‘informing the normative approaches driving policies and practices’*; and *‘as such, it appears as a pre-condition to creating alternative agrifood models’*. Hence, with their ability to foster unlearning and the legitimization of marginalized knowledge CoPs may confront what Carolan (2006a) describes as epistemic barriers, that stand in the way of alternative practices, world views and behaviors, and which constitute a particular concern with respect to transitioning towards sustainable agriculture.

In what follows, I will apply the CoP concept to the PFLA to describe how a new community based on purely pasture-fed farming practices has become established in the UK. This will be followed by a discussion about the success factors that were essential in stimulating social (un)learning processes, enabling the

²⁴ Wicked problems describe problems that are difficult or even impossible to solve. For a useful overview see Peters (2017).

exchange of sticky knowledge and disseminating the community's knowledge beyond its own boundaries. However, first a few words about the research approach are pertinent.

4.3 Methodology

Data for this article was gathered between 2017-2019 as part of a social-anthropological research project on New Directions in Agri-Environmental Governance.²⁵ While the UK was deliberately chosen as one of the sites to explore this topic, it was neither expected to come across the PFLA nor planned to study it in-depth, or with any specific theory in mind. In the true spirit of grounded theory (Charmaz, 2006) and ethnographic fieldwork, I stumbled upon this case after several months in the field during an interview with a project officer of an environmental charity. Melanie, my respondent, was reflecting about her work with farmers and the challenge to strike a balance between conservation objectives and productivity through a focus on food quality, when a particular farmer sprang to her mind, who she thought would be of interest to me. In her words:

'Oh, I've got a good farmer for you to go and visit. There's a guy called Nick [...] in [place name]. It was arable land and it wasn't being productive [...] I think they had potatoes, and just year after year [...] the crop was failing. [...] so Nick said: Right I think we should buy loads of wildflower seed [...] he ordered loads of seed and just spread it [...] It's not species rich rich,^[26] but it's got a lot of nice wildflower species in there. And he says the cattle are so much healthier because of all the nutritional benefits and then he sells the meat as part of this pasture-fed thing.' (Melanie)

This '*pasture-fed thing*' turned out to be the PFLA and Nick turned out to be one of its founding members. After interviewing him about his involvement with the PFLA, I decided to explore this case further and to follow its developments alongside another case study that I was working on as part of the overall research project.²⁷

This follow-up included semi-structured interviews with three key informants including two PFLA farmers as well as the chairperson of the association. It was the latter's repeated emphasis on the '*sense of community*' and the '*loving generosity*' that he felt existed within the PFLA, that initially struck me as something unusual during the interview. However, it was only after discussing some of the case material

²⁵ For more information see: <http://p3.snf.ch/project-157414>

²⁶ The original statement contains the word *rich* twice to emphasise the level of species diversity from the respondent's perspective.

²⁷ The other case study explored partnership working in the context of agricultural diffuse pollution.

during an academic workshop that the CoP concept was brought to my attention.²⁸ Building rapport with the chairperson allowed me to obtain access to around 50 internal documents. These include, among others, the minutes of meetings, annual reports, the company's act, various PowerPoint presentations and PFLA reports. While a closer examination of these documents provided rich insights into the historical development of the association, I also wanted to be able to say something about the current developments. For that reason, I decided to conduct participant observation including a multitude of informal conversations at nine events and farm walks, that were either organized by the PFLA or by other organizations, which invited PFLA farmers to give public talks about their work. This way I got to see and hear about the pasture-fed stories and farming styles of additional PFLA farmers.²⁹ Lastly, I decided to become a member of the PFLA myself since '*membership is open to anyone – not just farmers*' (PFLA, n.d.-a). This also gave me access to the online forum of the association, which constitutes a particularly valuable data source for understanding how the group works and what kind of information and knowledge circulate amongst its members.

The PFLA Google Group functions as an e-mailing list and encourages its members '*to share knowledge, experience and thoughts with each other in relation to grazing systems championed by the PASTURE FOR LIFE certification mark*' (PFLA google group description; emphasis in original). With over 2500 discussion threads the topics covered over the years are vast and range from technical advice to political and socio-economic matters of concern. Accordingly, key debates revolve around the management of farms and pastures. Other recurring topics include soil, climate change and carbon sequestration, or the sales and marketing of pasture-fed meat and dairy. Members also find it useful to share information about certain events and books, or their opinions about politically sensitive issues such as veganism or the use of glyphosate. The contributions in the forum represent genuine accounts of personal opinions and information that has been shared between peers, without a moderator or me as the researcher leading the discussions in any particular direction.

While undertaking ethnographic research online, I did not introduce myself as a researcher to all forum members for a number of reasons: First, access to the forum is in principle open to anyone willing to join the association. It is thus well-

²⁸ I thank Michael Carolan for introducing me to this concept.

²⁹ Conversations at these events were either partially audio-recorded or quotes were noted down on site.

known that there are a range of passive observers from various organizations and backgrounds. Second, *‘the state of flux in which web sites, blogs, forums, and social networking sites operate “defies conventional research methodologies”’* (Toulouse, 1998, p. 6 cited in Murthy, 2008, p. 849). In this case, had I introduced myself it would have hardly fulfilled its purpose as it would not have been noticed by more than a few members at the time before getting lost amongst hundreds of other entries. Third, *‘the uniquely unobtrusive nature of the method [digital ethnography] is the source of much of its attractiveness and its contentiousness’* (Kozinets, 2002, p. 65). With this, of course, comes an ethical responsibility to protect the research subjects and respondents, as well as to consider my representation of their interests. To avoid potential harm, I use pseudonyms throughout this paper, except for instances in which someone was acting in a public capacity. Nevertheless, I have chosen to provide some farm details to give the reader an insight into the types of farmers involved in the PFLA. Given that the material presented herein is not of a highly contentious nature and the research subjects do not constitute a particularly vulnerable group, this level of anonymization was deemed sufficient. I did, however, seek and gain permission from individual members to reproduce their images shared in the forum for the purpose of this research. Furthermore, I obtained informed consent and explicit support from the chairman of the PFLA to conduct my research and to utilize their resources. I also introduced myself as a researcher during PFLA farm walks and events and gained informed consent from all interview partners.

I would contend that this ethnographic research approach based on key-informant interviews, document analyses and participant observation has put me into the position to learn about the past, the present, the physical and the virtual world, in which the members of the PFLA have been operating. Most importantly this allowed me to anticipate some of the difficulties that arise from wanting to understand CoPs in actual practice and to represent forms of knowledge that are sometimes *‘more-than-representational’* (Carolan, 2008, p. 408). In particular: If more effective learning takes place through engagement and practice within certain communities (as stipulated by Lave and Wenger, 1991), then doing research about this phenomenon ought to be more engaged, if not also practiced. Otherwise, the processes and depth of learning and un-learning cannot be fully captured, appreciated, and adequately represented in research outputs. Thus, by enrolling myself within the PFLA, I was able to follow the conversations and to learn about the multitude of aspects that

make this particular CoP what it is. A more distant approach built on interviews or surveys alone would not have allowed me such an emic perspective.

Similar considerations also apply to how one represents something that is difficult to represent. On this second issue Carolan (2008, p. 412) reminds us that: *‘we cannot literally feel in these pages what respondents truly experienced in their lived experience. But this does not mean that we cannot at least get a taste of their world through their words.’* This is exactly what the remaining sections of this paper seek to convey as well and why I have chosen to let the protagonists speak with their own voice to showcase the tone and quality of interaction within the community. In addition to people’s words, I also believe the context (e.g. online or offline) and circumstances under which they become formulated (e.g. vis-à-vis fellow farmers or myself as a researcher) are of relevance, as well as any other means of expression used to either transmit lived experiences or pick other people’s brains for their sticky knowledge.

4.4 Cultivating a new community of practice: The story of the PFLA

According to its longstanding chairman, John Meadley, the story of the PFLA dates back to November 2009, when he ran into two livestock farmers during a Transition Farming conference in Exeter. At this meeting the three men shared a cup of tea and discussed *‘the absurdity of using half the world’s grain to feed livestock’* (PFLA, 2011a) and the possibility to rely solely on grass and pasture instead. While the trio met by chance, the topic they came across was no coincidence. As a development aid practitioner working in poor and post-conflict countries, John Meadley felt that it was bizarre and immoral to feed vast amounts of grain to animals as long as there was poverty and hunger.³⁰ With John Turner and John Crisp, he came across two livestock farmers who shared his concern and who proved – through their own farming practices – that raising animals fully on pasture was indeed possible. It was this chance encounter that resulted in a commitment to do something about it, and what followed from this has had important implications: It marked the beginning of a new CoP based on purely pasture-fed livestock farming, which will be described in the following by referring to the three key characteristics as proposed by Lave and Wenger. Moreover, many of the empirical examples within this section serve the dual purpose of underpinning the analysis of the success factors of the PFLA in Section 5.

³⁰ Pers. communication, John Meadley, Ryeford, 7 July 2017.

4.4.1 Creating a joint enterprise

To pursue their common concern, the trio first setup a google discussion group to share ideas and to enable a *‘further refinement of the Pasture-Fed term’* (PFLA, n.d.-b). Next a physical meeting was called in January 2010 to see if other people shared their interest. According to the minutes of this first official meeting (PFLA, 2010a), 14 people attended including eight farmers and one butcher. At this meeting John Crisp outlined the benefits of grass-fed livestock for human health, animal health and the environment, which was followed by a discussion around these issues. The group

‘agreed to focus on those benefits where the supporting science is sound and where we are walking on solid ground. This should provide the basis of future promotional material and also identify those areas where more work/research is needed [...] John Crisp agreed to lead this process, in consultation with others, and to produce a draft before Easter for electronic discussion.’ (PFLA, 2010a, p. 1)

John Turner introduced the second point on the agenda, which was dedicated to finding a common definition of grass-fed products. To launch the discussion, he referred to the American Grass-Fed Association, which had introduced its standards and definition in the year before. Consequently, the

‘Discussion revolved around issues such as the definition of forage, non-grass feed, artificial inputs, over-wintering, traceability, certification and assurance. It was agreed in principle that, as is the case in the US, the standards should be set high – with potentially a second tier for those who may be in the process of transition. John Turner agreed to prepare some draft standards, in consultation with others who are interested, for subsequent electronic discussion.’ (Ibid.)

Apart from these two key points the participants on that day decided to identify like-minded groups as well as potential funding streams, which would allow them to arrive at common standards, a brand, and *‘products in the shops supported by attractive and scientifically-sound promotional literature’* (PFLA, 2010a, p. 2) within 12 months’ time.

Another important decision was to remain non-judgmental and inclusive, which signals a desire to avoid any boundaries that have come with earlier niche market developments, namely organic farming. This meant that the group agreed early on

‘that farmers producing pasture-fed products should not be required to be certified as organic, as this could discourage some farmers who farm responsibly but do not wish to be formally “organic” – and also because organic farmers are not required to be pasture-fed, with many such organic

beef farmers utilising significant levels of grain in the feed.' (PFLA, 2010b, p. 4)

This premise is also reflected in the overall objective of the PFLA and has become enshrined in the legal act underlying the association's registration as a community interest company in 2011. Herein, the PFLA's role as an inclusive learning community is explicitly stressed:

'The objects of the Company are to carry on activities, which benefit the community and in particular (without limitation) to Pasture-Fed systems of farming and production. Recognising that the feeding of livestock wholly on pasture is part of a wider movement towards the development of farming systems that are sustainable in the long term, the Company will seek to engage with other organizations that share this vision, to learn from them and to share the knowledge, experience and information that the association generates over time.' (PFLA, 2011b, p. 5)

The choice to incorporate the association as a non-profit community interest company carries symbolic weight towards that end, as it allows a sense of shared ownership over this agenda.

Other milestones considered important by the PFLA are presented in Figure 12 and include, for example, the introduction of joint production standards, a QR code traceability system, the Pasture for Life Certification Mark, and the setup of an office in Cirencester in 2016. Over the course of these developments, the PFLA has managed to gradually increase its member base. The association grew from 21 members in 2011 to 506 members in 2019, including 93 certified meat producers (of which about 60 percent are also certified organic), 33 farm butchers, five independent butchers and four dairy outlets (PFLA, 2019). The remaining members are made up of individuals including consumers. Pasture for Life products can be purchased in certified retail outlets or from farmers, via direct sale, farmer's markets or mail order. The PFLA website provides an overview about retail outlets and detailed information about producers. It is worth pointing out that the development and running of the organization was achieved on a minimal budget. In fact, in its latest annual report the PFLA (2019, p. 11) describes itself as a '*low-cost operation*' due to an annual average expenditure of just over sixty thousand pounds since the company's incorporation. The association has relied on voluntary work and managed to secure grant funding from charitable organizations. Its main income is generated through the annual membership fees of GBP 100 per member and a sales levy of five pounds per slaughtered beef and 50 pence per lamb (PFLA, n.d.-c).

Chapter 4 – Social (un-)learning and the legitimization of marginalized knowledge...

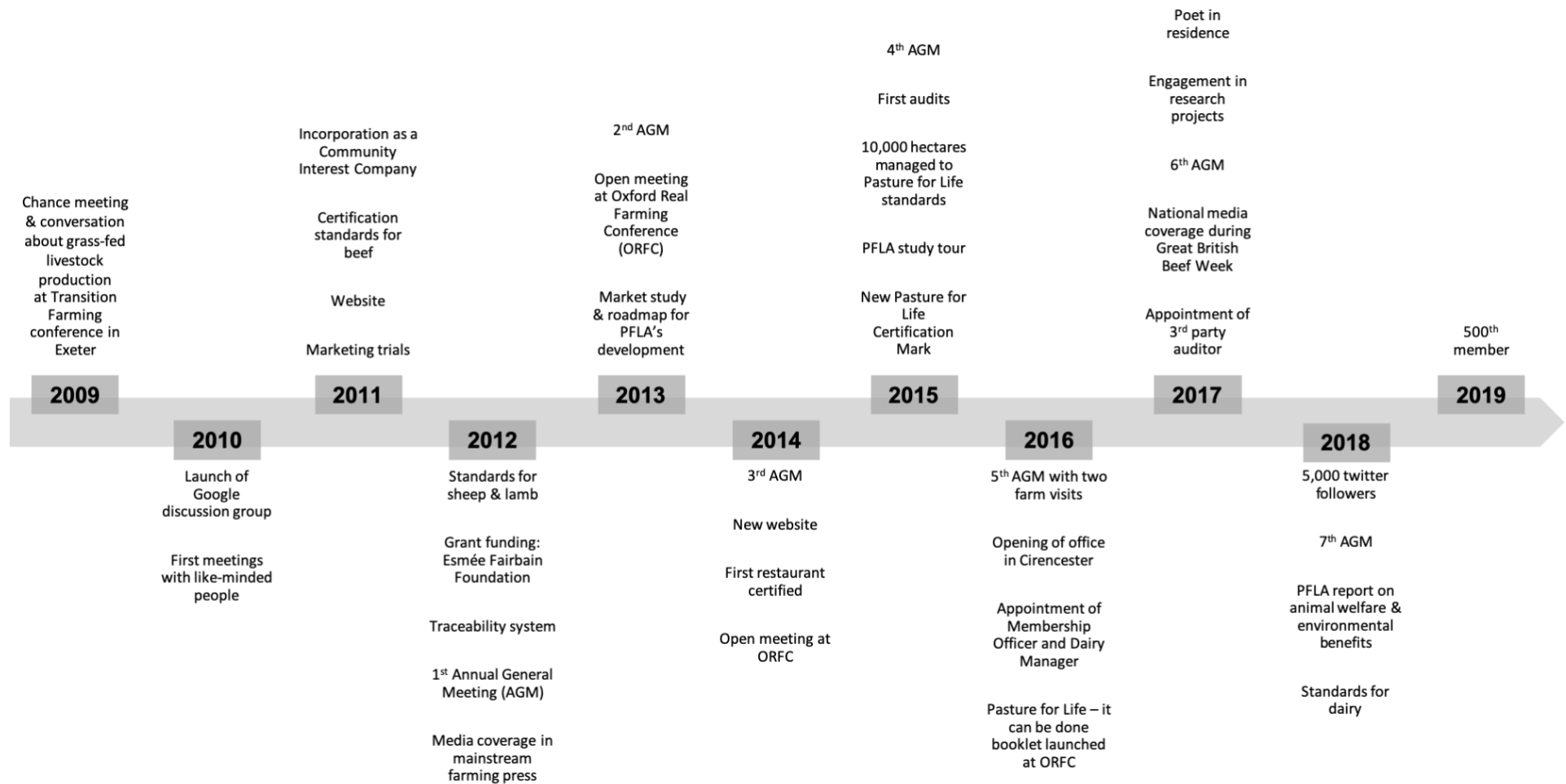


Figure 12: Timeline showing the major milestones in the development of the PFLA.

Realisation: Author. Source: PFLA (n.d.-b)

4.4.2 Nurturing mutual engagement

One aspect that clearly stands out in the backstory of the PFLA are the different means of communication used to create the association. From the beginning we saw a heavy reliance on ‘*electronic discussions*’ in addition to a few physical meetings each year. Accordingly, this section first illustrates how the online forum facilitates knowledge sharing, before describing the community building contributions of non-virtual encounters. At the same time this subsection does not only want to show how this mutual engagement becomes established (i.e. online or offline), but also the quality and nature of the exchange, which fundamentally contributes to nurturing this CoP.

4.4.2.1 Virtual encounters

The google group has become a valuable asset for the association. PFLA members regularly emphasized its benefits during public presentations and interviews. Indeed, gaining access to the forum was frequently mentioned as a key motivational factor to join the association in the first place. This is evident from the discussion thread ‘*Introductions*’, which invites ‘*all new members [to] briefly introduce themselves when they are ready*’ (Membership Secretary, 07 September 2014). Herein John and Steve, for example, ended their introductions with the following remarks:

one of my main interests in this forum will be to pick the brains of those of you who have made their systems work on grass (John, 14 November 2018)

A slightly late introduction I know, but I have found this group really helpful over the past few months and it is obviously a fountain of knowledge! (Steve, 17 October 2018)

To illustrate this ‘*fountain of knowledge*’ and the ways in which members pick each other’s brains, a discussion about the unusual dry spell during spring and summer 2018 serves as a case in point. The general manager of the PFLA raised this issue on 5 July by asking the farming members how they were ‘*Coping in the dry weather*’. In his words:

I’ve spoken to a few farmers this week who are beginning to get a bit desperate for some rain, even in usually wet places like Cumbria. I thought it might be worth sharing any top tips for how you are coping, what contingency plans you’ve put in place or how you’ve adjusted your grazing management? (General Manager, 5 July 2018)

His inquiry hit a nerve and resulted in 34 posts from 20 different members over the course of the next few days. Jeremy, a farmer from Hampshire (2500 acres; mixed farm), was the first to respond and he had to concede that the dry weather defeated all his plans. He explained: *'Hi [...]. Good idea to post now, I've had to ditch all my pasture fed aspirations and start feeding grain'* (Jeremy, 5 July 2018). Other members were more fortunate than that or perhaps better prepared as the next response from Ben, an organic farmer from Devon (251 acres; beef, pigs & vegetables), shows:

'top tips for me. Decided in April, after wettest winter for some time, and the likelihood that the chances that weather for the summer would likely be an extreme, were high to buy extra grass keep. So we have 10% increase in grassland [...] this allows us to have more acres grazing and more acres for conservation. cut back on the ploughing acreage. 50 % cutback in Spring Barley acreage. keep the best grass available for those animals closest to being fit for abbatoir [sic] so as to get them off farm ASAP. mob grazing works well for us in dry conditions. Any moisture in the soil lasts longer on grass that [is] 2-3 foot tall and the trampling effect helps as well.' (Ben, 5 July 2018)

This was also echoed by several other commentators who either posted further tips and information sources or reminded the group of the benefits of meticulously planned grazing systems. Joanne, a smallholder farmer from Shropshire (70 acres; organic; beef, sheep and micro dairy) and a key contributor to the forum,³¹ posted a detailed explanation about the need to measure grass growth continuously in order to avoid over-grazing. She shared her way of going about this with the help of a picture (Figure 13), that shows her fields subdivided into small plots.

³¹ With 388 posts since joining the PFLA in November 2014 Joanne ranks on 2nd place of all-time contributors to the online forum.

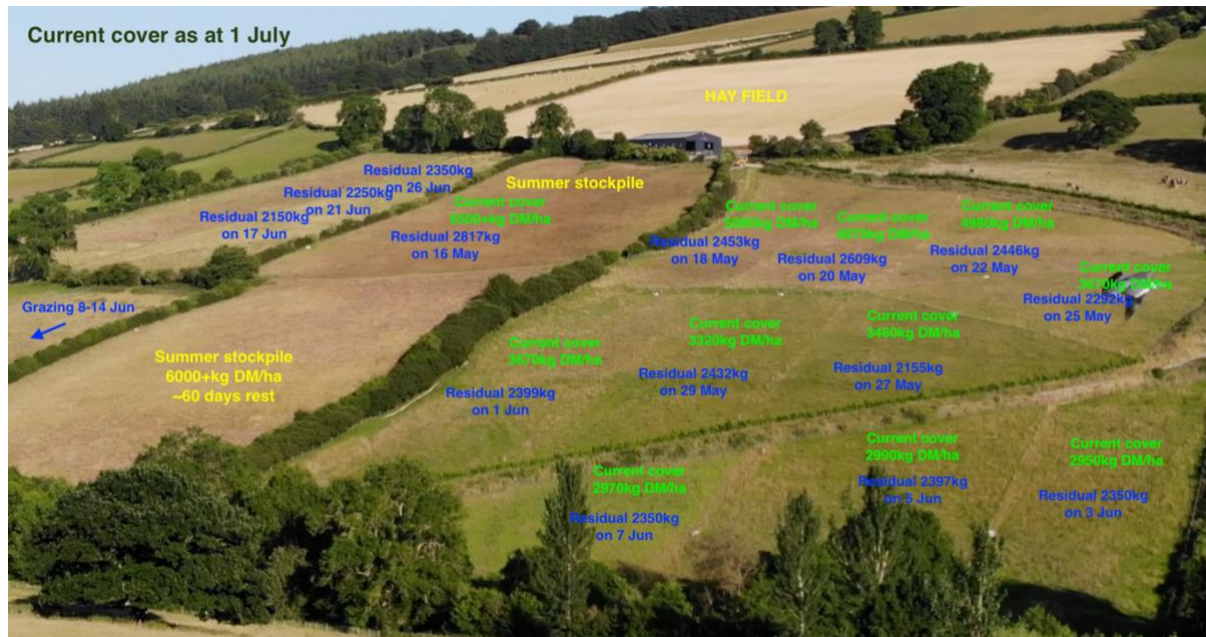


Figure 13: The picture shared by Joanne to illustrate her grazing management during the dry spell of 2018.

Source: PFLA forum.

Joanne, who was also interviewed for this research, follows the principles of holistic planned grazing (see Savory Institute, 2015), which involves moving her herd (or mob) of pedigree Herefords on a regular basis (often daily) from one plot to the next. According to her, this ensures a more even distribution of manure and utilization of forage, which she keeps track off with the help of a plate meter that measures the dry matter of pasture per hectare. The picture shows the current cover as well as the residual cover that was still available when she moved the mob onto the next patch. This allows her to observe and plan grazing with the growth rate in each of her fields. The sharing of such detailed information was immediately acknowledged by other readers. Brian from Lincolnshire (63 acres; in organic conversion, beef, sheep and pigs), for example, remarked:

‘This is very interesting and thought provoking for an engineering mind like mine! I just wanted to thank you for sharing this level of detail with the group. This is excellent and very much appreciated.’ (Brian, 8 July 2018)

The urgency to discuss coping strategies and the insights that participants were hoping to draw out from it also becomes clear in a later post from Graham (Lancashire; 1100 acres; organic; beef and sheep), who had to resort to contingency measures:

'We have just baled our first fields after negotiating a derogation [...] to break the 15th July start date. On average our crop is down by 75-80% in terms of yield and maybe similar in terms of quality, although I've not had this checked yet. Which is why I'm reading forum posts at 4.30am.' (Graham, 10 July 2018)

While this statement highlights the importance of the forum as a go-to resource, more senior members tried to reassure the rest that the lack of rain is nothing to be overly concerned about because they had experienced and handled worse situations: As William from Pembrokeshire (160 acres; organic; beef) recalled: *'We [...] survived the 1976 drought and it was far worse than this year, we have a long way to go before replicating 76'* (William, 8 July 2018). This was also seconded by Bill from Dorset (110 acres; organic, dairy) who – like William – provided some of his earlier crisis-proven tips including the use of trailers and sheets to provide shade for the animals.

Thus, reassurances like this were thought to be equally helpful as the sharing of detailed technical knowhow. Several other members for instance resorted to taking pictures of their own fields to show everyone how their current grass situation looked like (Figure 14). One of them was Ted from Hertfortshire (2500 acres, arable & beef) who explained:

We are slightly under-stocked [...] good year to pick. But by dint of leaving a good proportion of the grass ungrazed at each pass (i.e. moving the mob through quickly) and allowing plenty of time to recover, it is amazing how much regrowth you can get even when you can barely tread an electric fence pole in the ground because it's so dry. Photo of main mob yesterday. Field last grazed 15th may. (Ted 18. July 2018)



Figure 14: The picture shared by Ted in the discussion thread ‘Coping in the dry weather’.

Source: PFLA forum.

Again, this helped others to regain confidence that they were on the right track with their own farming practices. This is well encapsulated in the last comment of the discussion, which comes from Sue, an organic farmer from Kent (175 acres; beef, sheep and poultry). She replied:

‘Dear Ted, That is such an encouraging picture! We have just started mob grazing this year [...] I have been telling myself that our mob grazed fields will come back a lot quicker than the rest due to this residue’ (Sue, 18 July 2018)

4.4.2.2 Non-virtual encounters

In contrast to the online forum opportunities for non-virtual encounters are far more limited due to the geographical distance between most members, everyone’s time constraints and different financial capabilities. However, this is not to say that such occasions are of inferior value when it comes to nurturing mutual engagement and social learning. Each year the PFLA organizes a few farm walks in connection with the annual study tour and the Annual General Meeting (AGM). Furthermore, thematic days have been held in the past in partnership with other organizations (e.g. British Ecological Society) or were self-organized by some members, who were keen to explore certain aspects of pasture-fed farming in the field (e.g. soil monitoring).

What is noteworthy about these on-farm events is that they uphold the same spirit of peer-to-peer learning that also characterizes the interactions in the online forum. Neither did PFLA staff members introduce host farmers as “best practice” examples or “demonstration farms” – which is otherwise common practice within the agricultural industry³² – nor did the hosts present themselves as experts. On the contrary, hosts often began their farm tour with remarks about the many mistakes they still make. For example, during one such occasion aforementioned Ted from Hertfordshire began his tour with the following statement:

‘The main mob, which is about 200 animals, is just over there. We’ll wander and have a look. We’re mob-grazing them. Erm...Eh...Ah...Argh...We’ll see what you think. I’d be very interested to know! There are a lot of professional mob-grazers here and we’re probably doing it completely wrong.’

While his worries earned him many laughs, such understatements helped to engage the audience as equal partners. Thus, rather than patronizing others with their knowledge and achievements, the hosts tended to shift the focus on their personal learning trajectories and the challenges they still face. This usually resulted in open and genuine dialogue, in which the hosts benefitted from the feedback as much as the participants from gaining comparative insights.

Moreover, such on-farm events made different approaches to pasture-fed farming more understandable and tangible. During another occasion in Gloucestershire host farmer Bill, for instance, explained that it was his hobby of wildlife photography that led him towards pasture-fed farming: His journey had begun 12 years earlier, when his desire to see more wildlife on his farm coincided with his frustration over *‘marginal arable yields’* and the realization that the land on his farm *‘probably should have never been ploughed in the first place’*. He opted out of intensive arable farming and moved from *‘greening around the edges’* to *‘tackling the central problem of making the whole farming system intrinsically wildlife friendly’*. For him this meant planting wildflower meadows and herb-rich leys; introducing a herd of pedigree Hereford cattle; converting to organic farming; as well as certifying and directly selling his pasture-fed meat. During the farm walk Bill led his audience over his meadows to inspect and discuss the various species of plants and called on everyone to help him move his cattle from one mob grazing field to the next.

³² This is based on my own observations from participating in farm walks of other organisations in the UK. For similar insights about the nuances and differences between field days in conventional agriculture versus sustainable agriculture see also (Carolan, 2006b).

Participants examined the health of his soil through touch and smell and could finally savor the flavor of his meat during a communal lunch.

Beyond the farm-level physical meetings are also used by the PFLA to engage with people outside of the CoP itself. Previous AGMs, for instance, saw a welcome message by the Minister of State for Agriculture, Fisheries and Food, a talk by the director of Rothamsted Research (the world's oldest agricultural research station), and a keynote presentation by the Chairman of the Natural Capital Committee (a government advisory committee). Moreover, the PFLA has held meat tasting events to attract the interest of chefs, food bloggers, and food festival-goers. During these latter events, participating PFLA farmers tell the audience background stories about the lamb, hogget, mutton or beef that is going to be tasted, which informs the discussions and culinary assessments in important ways. During one of those events in London, aforementioned Nick, for example, supplied an

'eight-year-old sheep [that] had successfully given birth seven times in her life. But she had come to the point where she had lost all of her teeth, and was unable to graze. She too had only ever eaten herb-rich meadows all her life, self-medicating when she needed it and taking in the minerals and trace elements the deep-rooted plants had drawn up from the soil.' (PFLA, 2017)

With this in mind consumers were challenged to think about the impact that livestock feed, soils, grasslands, breeds and animal-welfare conditions have on the multiple qualities of meat including its taste, flavor and texture.

At another event, consumers have described the terroirs of different meats as varied as 'rugged' and 'stoney'; 'soft', 'subtle', 'buttery' and 'caramelly'; or 'rich', 'herbal', 'rounded' and 'nutty' (PFLA, 2016c); which for some was surprising:

'To be honest I wasn't sure there would be a difference between the four – but I was wrong. There was so much difference between the raw and cooked shoulders. Each one tasted fantastic – but fantastic in its own way – reflecting very much what it had eaten throughout its life; each had its own 'terroir'.' (PFLA, 2016c)

Here we see that the meaning of meat is changing as it becomes augmented by an understanding of the unique conditions that contribute to the taste of each and every animal.

4.4.3 Developing shared repertoires

Taken together such virtual and non-virtual interactions have allowed PFLA members to create and shape a shared repertoire. Over the years this repertoire has grown

and become very diverse. It includes symbols (such as the certification logo), gestures (such as a minute of silence prior to each AGM), words (such as ‘*craft meat*’) and ways of doing things (such as mob grazing) that determine the PFLA’s collective identity. Two central elements of this shared repertoire are the production standards, which the founding members have jointly agreed upon, as well as evidence reports that synthesize the knowledge held within the group. The following subsections examine these two elements in turn.

4.4.3.1 Pasture for Life standards

Contrary to what one might expect, the Pasture for Life standards contain a significant degree of freedom. The 56-page strong standards document consist of ‘*Required Standards*’ that must be met in order to become certified and ‘*Recommended Standards [which] say that something “should” be done*’ (PFLA, 2016b, p. 7). This unorthodox combination of prescription on one hand and optionality on the other hand is intended to ensure compliance with the strict grain-free feeding regime while providing farmers with freedom as to how they wish to achieve that.³³ It can thus be understood as an expression of trust into the abilities and skills of each farmer. After all ‘*the Certification Standards relating to production have been developed by farmers who have successfully refined their own pasture-based farming systems*’ (PFLA, 2016b, p. 14), emphasizing herewith both their adaptive capacity and the biological boundaries of each farm, which ultimately set the limits for the number of animals that can be fed on pasture alone. Consequently, the stocking rates, for example, are left to the discretion of each farmer:

‘The number of livestock should be properly matched to the capacity of the grassland and the soil conditions. The PFLA recognises that in practice, the sustainable stocking rate is as diverse as the grassland and as such the figures set out [...] are for guidance purposes only.’ (PFLA, 2016b, p. 16)

Similarly, specialist grazing techniques such as mob grazing are not mandatory, but strongly encouraged so that farmers can improve their performance and reduce their reliance on external input such as supplementary feed, chemical fertilizer, pesticides, or antibiotics. In practice this has led to various interpretations and management approaches as discussions in the online forum or during farm walks revealed: Depending on personal circumstances and priorities some members such as Peter follow the principles of mob grazing very closely.

³³ Pers. communication, John Meadley, Ryeford, 7 July 2017.

I have been mob grazing for 5 to 6 years or so [...]. The paddocks are split up into lanes approx. 50 metres wide [...]. The cattle are moved at least 2x daily some times more depending on grass cover, conditions underfoot and what i am trying to achieve with pasture fertility (trampling) or cattle dry matter intake. Stocking density at grazing regularly hits 120 000kg / hectare fantastic system don't know how high the production ceiling is and fertiliser, pharmaceutical, machinery dealers have very sparse pickings from the enterprise. (Peter, online forum, 15 April 2016)

Others like Sandy keep their flock of sheep and herd of cattle *'together in a 'fled'* [and] give them 2-3 days worth of grazing units' (Sandy, online forum, 25 July 2017) so that they have more space and time during lambing and calving. And yet others cannot or do not want to commit to one single grazing technique and instead practice all sorts of methods including holistic planned grazing, rotational grazing, set stock grazing and strip grazing in order to cope with the conditions of eight different locations spread across a single farm enterprise (George, PFLA farm walk, October 2017).

As such the standards can be seen as a framework that provides orientation and encourages learning by doing to guarantee the applicability of pasture-based farming across diverse farming environments in the UK.

4.4.3.2 Evidence reports

Demonstrating the feasibility of pasture-fed farming vis-à-vis non-members has become part of the shared practice, too. In order to trigger interest in pasture-fed farming and to actively contribute to a stronger evidence base around its merits the PFLA has begun to gather its own evidence. A case in point is the promotional brochure *'Pasture for Life, it can be done – The farm business case for feeding ruminants just on pasture'* (PFLA, 2016a). The steps involved leading up to its publication illustrate the collective efforts that go into co-producing community knowledge. First, the chairperson sent around a simple word document in 2014 to 12 farming members, who were willing to provide input. This small survey included closed and open-ended questions about the characteristics of each farm, the farmer's pasture and livestock management practices, and their results realized from raising ruminants wholly on pasture. In a second step the collected information was then summarized to highlight common features and benefits³⁴ (Table 6).

³⁴ The distinction between the categories 'features' and 'benefits' might appear somewhat arbitrary. However, they were chosen by the PFLA to represent their data in the original source.

Table 6: Summary of internal survey results.

Features	Benefits
1. Low cost	1. Benefits biodiversity
2. Fits in with Higher Level Stewardship agreements	2. Healthy animals
3. Minimal labour input	3. Healthy environment.
4. Healthy stock	4. Healthy end product.
5. No wormer / fertiliser cost	5. Answering customer's concern
6. Maintain herd fertility	6. Reconnection with customers
7. No brainer on hill farm	7. Gives pride in what we produce
8. No reduction in growth rates since dropping grain	8. Tastes good
9. Increase in soil health	9. Feeling happy and satisfied
10. Cattle/sheep suit type of farm/grazing and vice versa	10. Very tender lamb produced
11. Surprised at profitability	11. Grass fed cattle outperforms cereal fed cattle profitability
12. Keeps it simple	12. Nutrient dense meat

Source: PFLA (2014).

This exercise underlined the feasibility of pasture-fed farming in a variety of contexts. Accordingly, pasture-fed beef and sheep could be produced in different counties, on small and large farms, organic or not, on different soil types, with different grazing systems and different breeds. However, it did not provide any robust information about the economics, apart from surprise about the profitability. The logical consequence therefore was to engage in benchmarking to see how this anecdotal evidence fared against the hard figures of the industry. For that purpose, eight PFLA farmers subsequently engaged with consultants of the AHDB Beef & Lamb Stocktake costing service to compare their financial and performance data with the benchmark figures for 2015.

'The results show that producing beef and lamb on 100% pasture and forage crops can be done and can be profitable. By selecting the right breeds with the most suitable genetics, coupled with good grassland management, Pasture for Life farmers can rival and exceed the performance achieved by the top third of producers.' (PFLA, 2016a, p. 1)

Those arguably more authoritative results were then presented in detail in the aforementioned brochure, which was officially published at the Oxford Real Farming Conference 2016. According to the chairman this document proved to be pivotal in

winning other livestock farmers over to consider conversion to purely pasture-based systems and to eventually join the association.

4.5 Exploring the success factors of the CoP

Overall, the insights gained from applying Lave and Wenger's (1991) analytical framework to the case of the PFLA as illustrated in the previous section have been useful to retrace the evolution of this new CoP. As in the case of Brédart and Stassart's (2017) Belgian livestock farmer, feed autonomy and purely pasture-fed livestock systems were only advocated by a few individuals, who were largely unaware of each other and not gaining much recognition for what they did. In the UK this has begun to change with the formation of the PFLA. The association has linked up like-minded people, pooled and formulated their shared interests, and quite literally created '*a "grass roots" movement*' (Perry, 2014), that has greatly improved the viability and visibility of pasture-fed farming and pasture-fed products. This puts the success factors at the center of attention that have proven to be critical in the development of this specific CoP, as well as for engendering transitions towards more sustainable agri-food systems more generally.

4.5.1 Stimulating social un-learning

First, new CoPs such as the PFLA hold the key to undo certain practices that stand in the way of transitions towards more sustainable agri-food systems. We should therefore not only conceive of social learning in an acquisitive sense. Whether we take the online forum, the farm walks, the Pasture for Life standards or evidence reports, any of these community features allow its members to learn about innovation in livestock farming as well as to unlearn more dominant farming practices. Thus, as noted by Brédart and Stassart (2017) or more recently in Padel et al's (2019) study on UK farmers' transition pathways towards agro-ecology, farmers' learning trajectories never involve '*a simple switching from one way of farming to another. Rather farmers were unlearning conventional expectations by doing cognitive work on themselves, before and during a practical change*' (Padel et al., 2019, p. 22). In the case of the PFLA it is again mob-grazing that serves as a good example to illustrate this cognitive work and the dialectic learning and un-learning challenges that accompany it. Mastering this practice can take several years and initially requires

letting go of old convictions. As one PFLA farmer and experienced mob grazer explains in a blog entry dedicated to this topic:

'Mob grazing may give the impression that forage is wasted by being trampled or left until [too] tall to graze. Getting over this conventional view can be quite challenging, although [...] you'll soon see the benefits.' (Page, 2015)

According to the proponents of this practice it is exactly this trampling of forage in combination with longer recovery periods that contributes to the built-up of new organic matter, improves soil health and moisture retaining capabilities, helps to store carbon, increases biodiversity, and eventually leads to better pasture re-growth. However – as with most sustainable farming practices – this contradicts the logic behind conventional grazing practices and it takes time for the benefits to materialize and become visible (Carolan, 2006a). Hence, during the transition phase farmers are faced with a lot of uncertainty, which can create a psychological barrier and an internal struggle to part with what was previously practiced and accepted to be true.

Such challenges exist with many of the PFLA's recommendations – be that the advice to select traditional rather than modern breeds of sheep and cattle, to use nitrogen-fixing legumes instead of artificial fertilizer, to plant herbal leys as a remedy for self-medication, or to milk only once-a-day instead of twice. This last practice was described by one of the few pasture-fed dairy farmers as *'the antithesis of the high input, high yielding, intensive systems of mainstream dairying in the UK today'* (PFLA, n.d.-d). The withdrawal of energy-dense concentrated feeds prohibits the use of modern dairy cows and instead dual-purpose breeds become attractive again. Even though they realize lower yields, this practice can still be viable due to a higher content of milk solids, potential premium prices in niche markets, and less labor and stress for the farmer as well as the animal.

Unlearning in these contexts therefore often implies distancing oneself from the productivist principles that remain deeply associated with good farming ideals (Burton, 2004; Silvasti, 2003a). It includes questioning conventional yardsticks of measuring success primarily in terms of maximum yield or output, as well as the underlying strategies and practices to achieve these overdetermining objectives, such as the reliance on concentrated feeds, high performance breeding stock, monospecies swards and so forth.

While this cognitive work on oneself clearly plays an important part in becoming a PFLA farmer, I would add that this detachment from conventional

expectations (see also Vankeerberghen and Stassart, 2016) is not merely a cognitive exercise of the individual, but also a social undertaking. In fact, it is much easier – and perhaps only possible – when someone enters into new social relations with like-minded people, who accompany each other throughout this unlearning process. This shows strong parallels to the early organic movement in which the pioneers often faced social isolation in their own community and consequently had to build themselves a new support network of likeminded people (Padel, 2001). Therefore, the social dimension of unlearning deserves explicit recognition because breaking with previously held beliefs and practices is emotionally strenuous. It requires time and support to cope with the fears, uncertainties and vulnerabilities that are inherent to any change of practice or internal struggle over new and old knowledge. Receiving reassuring advice on the forum – and even if it just comes in the form of a simple picture showing the resilience of a mob grazed field during a dry spell – can therefore make all the difference to someone who is still experimenting with a novel practice.

4.5.2 Enabling sticky knowledge exchange

Second, the practices, ideas and innovations promoted within the PFLA underline the importance of farmers' own experiential knowledge. As the study by Oreszczyn et al. (2010) revealed, this is not necessarily the case in all CoPs within the agricultural context: CoPs developing around more technology-based innovation afford more formal knowledge, which comes at the expense of eroding tacit knowledge and informal learning. Within the PFLA, however, instead of such erosion, we have seen the active build-up and strengthening of contextualized, local knowledge, which is not only invaluable in coping with extreme weather conditions, but also in mastering the day-to-day challenges that come with making livestock farming work purely on grass.

This highlights the importance of an environment which enables effective knowledge exchange and peer-to-peer learning. I would posit that the PFLA's '*sense of community*' has played a pivotal role in this context. The organization has repeatedly stressed its own function as an inclusive and non-judgmental learning platform, that strives to create '*a positive movement*' with '*a caring and supportive community*', which is above all '*collaborative, sustainable and ethical*' (PFLA, n.d.-e). Importantly, these are not only officially adopted but lived visions and values, that have created an intimate and safe environment, in which members can share whatever they feel is worth sharing. This has resulted in diverse, open and trustful

discussions, which tend to be passionate and empathic, but rarely patronizing. This (n)etiquette characterizes both online and offline interactions within the community and helps to build meaningful relationships, which is after all what sets CoPs apart from less tightly knit forms of social learning organizations including networks or projects.

Another crucial pre-condition for effective knowledge exchange lies in the proximity created through the online forum. Given the caution and reservations raised in the literature about such indirect and physically distant means of communication (Carolan, 2011), it may seem remarkable that most of the interactions and knowledge exchange within the PFLA takes place online rather than face-to-face. In this case, the online forum has helped to bridge the spatial divide that invariable remains between most members. Moreover, it has provided a very effective tool to tap into the sticky knowledge of fellow members. As we have seen, this sticky knowledge is not necessarily non-representative – after all PFLA members are able to talk about their ways of doing things – but the knowledge that circulates within this group is intimately linked to people, place and personal experience. It may not have been verbalized or visualized before and certainly not shared as regularly and widely. In this sense the online forum creates a very effective space for community learning: It provides room to express oneself and the chance to be heard by others, it guarantees regular and reliable access to the knowledge of fellow members – even at 4:30 in the morning, it allows active participation as well as passive observation, and therefore it serves different learning preferences and purposes. Most importantly, this creates a form of social and cognitive proximity (Boschma, 2005), which may to some extent remain different from the face-to-face interactions described by Carolan (2011), but nevertheless can produce a lot of knowledge – rather than little – despite its mostly virtual and non-tactile nature. Thus, just as in the case of less-dispersed examples of CoPs studied elsewhere, the core value of a true community lies in the fact that it

‘gives its members people to talk to and a means for comparing practical circumstances, ever adapting others’ words to their own thoughts and offering their own words back for others to chew over, to reshape in light of experiences, and to give back to others once again’ (Bell, 2004, p. 235).

This encourages trying out new things, to continue on one’s way and/or reflect and potentially abandon old practices. In the end it is this proximity created through regular and meaningful exchange that matters most – and not the means of

interaction. Based on this we can understand that kicking the grain habit in livestock farming – or any other agricultural transition for that matter – *‘is not a process of adoption-diffusion. It is a process of adaption-diffusion’* (Ibid.).

4.5.3 Legitimizing community knowledge

The case study lastly serves as a strong reminder of the relationship between trust and knowledge networks that determine how farmers – and other actors – know and see the world (Carolan, 2007, 2006b). It therefore underlines the positive role that novel CoPs can play in ‘nurtur[ing] certain ways of “seeing”’ (Carolan, 2006a, p. 234) and by so doing de-marginalize alternative practices and knowledges. In fact, the legitimization of the community’s knowledge beyond its own boundaries is fundamental to ensure the long-term success of the CoP, as this rests on the understanding, appreciation and recognition of other societal actors. While this points to a demand that is frequently raised in the literature – namely the widening of dialogue beyond the farm level in order to transform the agri-food system (e.g. Bell, 2004; Carolan, 2011; Forney, 2016) – the PFLA shows us some creative ways towards that end.

One of these ways lies in the association’s own efforts to produce evidence reports about the benefits of pasture-fed farming by mobilizing and externalizing the sticky knowledge of its members. As others have pointed out *‘the mobilization and externalization of tacit knowledge is a key factor in creating new explicit knowledge and information for future use’* (Hoffmann et al., 2007, p. 362 drawing on Nonaka and Takeuchi, 2007). In this case, the conversion proves particularly useful in making the groups’ knowledge more accessible and comprehensible for actors outside of the community, who do not engage in the longwinded processes of learning and unlearning through socialization. In other words, PFLA reports on the economics, animal welfare, health or environmental benefits of pasture-fed farming formally express and explain what the group has learned from engaging in shared practice, thereby rendering this sticky knowledge explicit. This serves various purposes: for instance, the reports help attract interest to grow the member base; they give PFLA members a tool at hand that helps them to withstand in the increasingly fierce knowledge turf wars over the sustainability of *different* meat production systems; and they provide the basis for lobbying politicians as well as for generating interest within the research community.

Gaining interest of the latter group is important because the impact of own evidence reports is of course limited and always subject to the credibility that any reader attributes to the source. This is why scientific data is sought to substantiate and objectivize any of the claims made about the benefits of pasture-fed farming vis-à-vis conventional practice. The PFLA actively seeks to contribute to building such a stronger evidence base through the initiation of and participation in research projects, which expose the community's knowledge and practices to the scrutiny of external knowledge authorities. One such project is currently under way at the Centre for Ecology and Hydrology (a now independent, but formerly government-funded research center of the Natural Environment Research Council), exploring '*sustainable economic and ecological grazing systems*' by '*learning from innovative practitioners*' recruited exclusively out of the PFLA (Norton, 2018). Such projects with respected research bodies potentially verify the community's knowledge and provide more powerful evidence that is both tried and tested.

In order to mainstream this discourse, the PFLA then utilizes this information to lobby politicians to support their cause: from the beginning the PFLA leadership engaged in a continuous dialogue with various MPs and encouraged their members to do so themselves. For instance, their efforts resulted in a personal video message for their 2017 AGM from then Farming Minister George Eustice, who stated his belief in the benefits of pasture-fed farming. The long-term success of this endeavor to build their relationship with an elite that can grant them a certain legitimacy will largely depend on the new leadership of the association and the future course decided upon by its members.³⁵

Finally, yet another creative way to widen the dialogue presents itself in the aforementioned meat tastings. They nurture a sensual experience that seeks to capture the human and non-human efforts that go into producing pasture-fed products, thereby making a portion of this knowledge literally tastable: The different breeds and grazing systems, the landscapes and soil characteristics, the various species of grasses and herbs, as well as the labor of the farmer, the butcher and the cook all come together to create the unique tastes that consumers have ascribed to pasture-fed meats during such events. Thus, it is this embodied experience of the consumer that contributes to the co-production of a new facet of knowledge, which

³⁵ At the time of writing in February 2020 Bill Wiggins, a Conservative MP, resigned from his position as the latest chairperson after internal disagreement over the strategic development of the PFLA. A new leadership has yet to be elected.

then allows the community to speak of different terroirs and to further develop the understanding of their product and the craft that becomes associated with it.

As Carolan (2006b) found elsewhere, it is the ability to forge and nurture relationships with *'those who are perceived to be trustworthy by those within the dominant social networks'* (Carolan, 2006b, p. 334), that allows the proponents of sustainable agriculture to develop *'from a largely marginalized group of actors to legitimate discursive contenders'* (Ibid.). The PFLA is embarking upon this process of legitimization by trying to enroll industry actors, politicians, academics and consumers alike: Thus what began with simple knowledge sharing soon needed to find confirmation in the eye of other conversation partners and thereby satisfy and comply with different means of accepted proof – be that numerical evidence about the economic advantages, scientific proof about the benefits to animals, humans and the environment, or simply a distinct tasting product. Eventually, it is this multipronged approach that shapes a new discourse and holds the potential to contribute to the “normalization” of pasture-fed farming *'within an industry where the dominant sociotechnical imaginary denies systems differences'* (Shortall, 2019, p. 10).

4.6 Conclusion

This paper should have made clear that *'kicking the grain habit'* in ruminant livestock farming is neither a trivial nor a straight-forward undertaking. It is not simply accomplished by substituting concentrated feeds with grass, nor by putting a new label on a product and expecting demand and wider understanding to develop automatically. It is a complex and time-consuming undertaking, in which the PFLA as a CoP plays a central role. The community enables its members to partake in social learning and collective action by engaging them in a process of adaption-diffusion of the sticky knowledge that is so central to more sustainable ways of farming. While this corroborates earlier findings about CoPs and social learning, the insights also add to the literature in three important ways.

First, this case study has shown that online communication can be an excellent tool to provide this type of social learning experience. Virtual encounters within a closed and safe online environment can indeed facilitate regular exchange and help build meaningful relationships based on social and cognitive proximity, which are essential for any well-functioning CoP. This finding is of particular relevance for the

study of agriculture or similarly fragmented and/or dispersed sectors, in which geographical, financial and time-constraints can constitute a barrier to the development of CoPs. Therefore, virtual forms of communication within a protected space – such as a closed forum – hold the potential to reinvigorate an eroded sense of community within the agricultural realm and deserve further study within the literature on CoPs and agricultural transitions.

Second, the paper has argued for a stronger consideration of the role of unlearning within CoPs and urges us to become more mindful of the dialectic nature of learning processes more generally. As we have seen the PFLA functions both as a vehicle to learn about alternative practices as well as a means to unlearn more dominant ones, that stand in the way of conversion towards more sustainable agri-food-systems. It has shown that letting go of previously held beliefs and practices can be intellectually and emotionally strenuous and often necessitates the support of community members. The respectful sharing of different ways of farming on equal terms – rather than a top-down approach based on best practice examples – has proven to be of great value in this context. Therefore, the social aspect of unlearning plays an integral part in farmers transitional trajectories. Moreover, this ability to foster social unlearning is perhaps a particular advantage of CoPs compared to other organizational forms of learning in terms of their potential to engender practice change and transitions. As such social unlearning within CoPs merits greater attention within social learning theory, agri-food studies and the sustainability discourse.

Finally, it was emphasized that the wider goal of change towards a more sustainable food and farming system can only be achieved, if the new knowledge generated within the CoP can move out of the realm of a marginalized niche. This necessitates the pro-active creation of new learning networks, which enroll other powerful societal actors. The contributions and support of the research community, politicians and consumers legitimize the knowledge of the community and thereby empower the PFLA to shape public debates, policies and institutions. In the end all of these efforts of social (un)learning and collective action have resulted in the introduction of a new normative conversion approach towards more sustainable livestock farming in the UK. It remains to be seen whether this normative approach can be successfully upheld given the challenges that come with the growth of the association and the dynamics of mainstreaming pasture-fed farming. Therefore, the

future trajectory of the PFLA promises interesting insights for agri-food studies and should be closely followed.

Chapter 5 – When sociotechnical imaginaries meet everyday practice: Digitalisation and the transformation of agri-environmental governance practices and knowledge

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Abstract: This paper aims to contribute to the growing body of social science research which is concerned with digitalisation processes and their effects within the agri-environmental sector. By juxtaposing socio-technical imaginaries of agri-environmental governance with the everyday realities of various actors who are directly involved or affected by them, the paper documents and investigates how digitalisation transforms the configurations of agri-environmental governance practices. To illustrate and reflect on these developments, we draw on a range of qualitative insights from fieldwork carried out in the UK. The first example – a CAP compliance check using remote sensing – sheds light on power imbalances between farmers and civil servants that stem from unequal access to technologies and knowledge bases. The second example – #Soilpatrol – highlights the hopes and limitations of using live data to police the problem of agricultural diffuse pollution more effectively. The third example – Glastir Advanced – shows the pitfalls of visual representations using GIS layers in the design phase of an agri-environment scheme which had direct repercussions on farmer participation. The fourth and final example – the online forum of the Pasture-fed Livestock Association – then goes on to show how online exchange and knowledge sharing can act as a filter and tool for critical reflections about digitalisation itself. All four examples highlight the diverse pathways that digitalisation has taken within the agricultural sector and within people everyday lives, and they reveal some of the desired as well as some unanticipated consequences. The examples also demonstrate how people make use (or not) of digital technologies to further different agendas, which can both act as a driver or inhibitor for knowing and seeing the agri-environment. We conclude that everyday digitalisations such as the ones presented in here have epistemological consequences on all levels of agri-environmental governance – from control and enforcement to planning and decision-making. Thus, to better understand the challenges that these transformations in practices and knowledge have at the social and societal level it is paramount to render the processes of everyday digitalisation visible to avoid the naturalisation and depoliticization of such technologies.

Keywords: Agriculture; environment; digitalisation; governance; socio-technical imaginaries; knowledge

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5.1 Introduction

The topic of digitalisation within food and farming has received considerable attention since the 1990s and it continues to shape the research agendas of social scientists who are concerned with the study of agricultural change (Fielke et al., 2022; Ingram et al., 2022; Klerkx et al., 2019; Rotz et al., 2019). Over the years agri-food scholars, in particular, have made great strides in documenting, analysing and interpreting a large variety of digital technologies and developments including precision farming, big data, automation, robotics, artificial intelligence and blockchain to name but a few (Carolan, 2020, 2018; Fleming et al., 2018; Legun et al., 2022; Prause et al., 2021; Vik et al., 2019; Wolf and Buttel, 1996; Wolf and Wood, 1997). While this focus on *‘game-changing technologies’* (Klerkx and Rose, 2020) or *‘spotlight digitalisation’* (Forney, 2019; Forney and Dwiartama, 2022) provided important insights and generated more nuanced accounts of the claims, potentialities and (likely) impacts of digital innovations, people’s everyday encounters with more common modes of digitalisation has somewhat faded into the background. Only recently have some researchers taken an interest in how farmers – and indeed other key agricultural actors – live with various digitalisations (Forney and Dwiartama, 2022; Lundström and Lindblom, 2021; Rose et al., 2022), be they new and still in the spotlight, or relatively old and already taken-for-granted. Researching the everyday of digitalisation promises new and intriguing insights about this highly touted revolutionary megatrend. It forces us to look beyond the techno-solutionist discourses, and into the lived and place-based experiences of people. It urges us to critically examine the intersections and frictions between socio-technical imaginaries and everyday realities, and thereby enables us to appreciate and understand agricultural change in less linear ways (see also Rose et al., 2022).

With this paper we aim to contribute to this emerging strand of literature, and we specifically seek to widen its breadth by focusing on everyday digitalisations in various contexts of agri-environmental governance. In contrast agricultural production which provides the bread and butter³⁶ for social science enquiries of digital agriculture, (agri-environmental) policy and governance instruments remain understudied aspects of digitalisation and deserve more attention (Forney and Epiney, 2022; Klerkx et al., 2019). By employing and juxtaposing Jasanoff and Kim’s (2009) concept of socio-technical imaginaries with the everyday realities of various

³⁶ Pardon the pun.

agri-environmental governance actors, we explore the question how digitalisation transforms the configurations of agri-environmental governance practices.

To illustrate and reflect on these reconfigurations we draw on a range of qualitative insights from ethnographic fieldwork carried out in the UK. This includes a family farm's response to a CAP compliance check using remote sensing, a civil servant's description of a live data field trial to police the problem of agricultural diffuse pollution, a farmer's account of priority setting and exclusion from a digitally revised agri-environment scheme, and a private label's online forum which is used by its farming members to learn about and make sense of other digital innovations and gadgets. With these diverse examples we are able to document how various digital technologies are already permeating the lives of our protagonists, and how these are influencing many aspects of agri-environmental governance including regulatory control and enforcement, policy design and farmer participation, as well as on-farm decision-making. These influences of course do not remain without effects. They have epistemological consequences and important implications for agri-environmental knowledge – which constitutes another under-developed research topic within the literature on digital agriculture (Ingram and Maye, 2020). We address some of these knowledge implications in the discussion and argue that the intersections between digital and established modes of knowing and decision-making create many problems, but also new options and choices for agri-environmental governance. We conclude that it is paramount to render the processes of everyday digitalisation visible to better understand the challenges that these transformations in agri-environmental governance and knowledge have at the social and societal levels, and to avoid the naturalisation and depoliticization of technologies.

5.2 Key concepts

In this paper we draw on the two distinct, but complementary concepts of socio-technical imaginaries and everyday digitalisation. We will address each of these concepts in turn before explaining their relevance for the study of agri-environmental governance practices and knowledge.

The first concept – socio-technical imaginaries – was initially developed by Jasanoff and Kim (2009) and later redefined as *'collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and*

supportive of, advances in science and technology' (Jasanoff, 2015). As such this concept denotes attention to both the aspirational and imaginative nature of technoscientific developments as well as to their normative and highly political underpinnings. Digital agriculture, of course, ticks all of these boxes and thus unsurprisingly this concept is gaining traction among critical scholars within this field of enquiry. For example, the concept has been referred to and/or employed in studies of power relations and inequities of big data and digital platforms (Carolan, 2022), to illustrate the manufacturing of public discourses of precision agriculture by finance and agritech interests (Duncan et al., 2021), or to debunk the myths of this so-called fourth agricultural revolution by rendering counter developments and narratives visible (Rose et al., 2022).

In a few cases, such as the contribution by Rose (2022), or Forney and Dwiartama's (2022) comparative study of digitalisation processes in Switzerland and Indonesia, socio-technical imaginaries have been combined with the second concept of everyday digitalisation. This second concept draws attention to peoples' lived experiences with digitalisation and focuses specifically on the questions of '*if, how and why*' (Rose et al., 2022, p. 3) farmers and other governance actors make use (or not) of digital technologies. This includes peoples' actual practices with various digital tools (including their intended or re-invented uses) as well as their regular (or even routine) encounters with digitalisation through various processes, institutions, norms or networks (e.g. professional networks, audits).

Combining the two concepts has obvious advantages as only then are we able to see and understand more clearly how imaginaries play out in the real world. It allows us to track and explain how such technologies are mobilised, by whom, and with what effects. Doing this is not only important on the production side where most research attention is currently focused, but also in relation to agri-environmental governance (Forney and Epiney, 2022). For example, whereas '*Imagination [...] guides the simplification and standardization of human subjects so as to govern them more efficiently*' (Jasanoff and Kim, 2009, p. 122), detailed observations about the everyday can expose the shortcomings of such simplifications. Thus, carving out the frictions, discrepancies and inconsistencies, but also the interrelations, overlaps and feedback loops, that exist between visions of agri-environmental governance and its everyday realities – as experienced by those actors who are directly involved or

affected – is critical to gauge and assess the implications of digitalisation both in terms of practices and knowledge.

As any other part of the agricultural sector, agri-environmental policy and governance has been influenced by different digitalisation trends (Ehlers et al., 2021; Forney and Epiney, 2022; Kloppenburg et al., 2022). In fact, the use of certain digital technologies and artefacts like computers, the internet, mobile phones, GPS, satellites, or GIS have become increasingly normalised and are now essential means to plan, enact and access public or private agri-environmental governance schemes and labels. However, as mentioned earlier the implications of such reconfigurations for agri-environmental knowledge remain only partly understood, despite expectations that digitalisation *‘will intersect with established modes of knowing and decision making’* and therefore *‘require us to fundamentally rethink these knowledge processes and to reflect on the consequences of a shift toward data-driven processes’* (Ingram and Maye, 2020). Again, we believe that this rethinking should not be limited to headline questions (e.g. Can algorithms replace farmers’ knowledge? Will digitization make inter-personal learning obsolete?). It must also include detailed accounts about how different modes of knowing and decision making intersect in everyday practice and attend to the challenges and opportunities that arise from these intersections. Most importantly it must render visible and scrutinise the politicalness of digitalisation which can remain obscured under technology’s false disguise of neutrality and objectivity (Kloppenburg et al., 2022).

With the subsequent analysis we want to contribute to this collective rethinking and scrutinising. We use the concept of sociotechnical imaginaries in conjunction with everyday digitalisation to illustrate how digital technologies become mobilised in various contexts and with what effects for those affected or involved. With our empirical examples we pinpoint several aspects in agri-environmental governance that we see emerging from the alteration of options and choices for knowing and decision-making. This includes inconsistencies and discrepancies between digital and established modes of knowing and decision-making, the combination of the two to make previously unseen things visible, and the filtering and sense-making of digital vs manual aids. However, before we dive into the analysis a few words are needed to outline our methodological approach and considerations.

5.3 Methods

In contrast to other researchers who have employed the concept of sociotechnical imaginaries within STS (e.g. Jasanoff and Kim, 2009) and agri-food scholarship (e.g. Shortall, 2019), we did not set out to study this concept nor did we explore national policy documents to derive and analyse any articulated sociotechnical imaginaries. We, rather inadvertently, uncovered some of them by exploring everyday governance practices in the UK as part of a wider project on New Directions in Agri-Environmental Governance.³⁷ This wider project, funded by the Swiss National Science Foundation, brought the main author of this paper to the UK to conduct long-term ethnographic fieldwork within the Welsh-English border region between 2016 and 2019. The focus of this fieldwork was on the assemblage of payments for ecosystem services (Wynne-Jones and Vetter, 2018), social (un-)learning processes between a group of ruminant livestock farmers (Vetter, 2020), and partnership working in the context of agricultural diffuse pollution (Vetter, 2022). Digital technologies were not studied per se, but they have been an integral part of any of the above governance arenas. In fact, we obtained a wide range of insights into the everyday workings of digitalisation which allow us to say something beyond the discourse level. We do not claim that these insights are in any way complete or representative of nationally endorsed or promoted sociotechnical imaginaries, they are simply illustrative, and we believe worthwhile to report and interpret.

The empirical material used in the subsequent sections derives from participant observation, semi-structured interviews and document analysis including social media posts and entries in online fora. Each analytical section contains more specific information about the qualitative data used to support our case and arguments, and a more comprehensive overview about our overall research approach and the gathered empirical material can be found in Forney (2014) and Vetter (forthcoming).

5.4 Four examples of everyday encounters with digitalisation

5.4.1 A CAP compliance check: Fighting satellites and bureaucrats with pen and paper

The first example illustrating the frictions between sociotechnical imaginaries and everyday realities draws on a farm visit and in-depth interview with a staff member of an environmental charity, who also runs a traditional mixed farm together with her

³⁷ For more information see: <http://p3.snf.ch/project-157414>.

husband and son in Herefordshire.³⁸ This farming family once received a stack of approximately 50 satellite images in their mailbox accompanied by a letter informing them about an unannounced remote sensing audit which had been carried out on their farm. In England such audits are conducted by the Rural Payments Agency on behalf of the Department for Environment, Food & Rural Affairs [DEFRA] to check for compliance with the rules and regulations underpinning farmer's direct payments under the Common Agricultural Policy [CAP]: i.e. inspecting if a farmer's subsidy claim corresponds with the declared land area, farm features and good agricultural and environmental conditions.

The sociotechnical imaginary in this case goes back to European regulations that *'require national administrations [...] to undertake detailed checks on 5% of farmer applications each year, and this is now mainly carried out using remote sensing controls'* (SSGP, 2020). Applying earth observation technologies in UK agri-environmental governance was facilitated by the UK Space Agency as part of their Space for Smarter Government Programme which aimed to *'enabl[e] the public sector to save money, innovate and make more effective policy decisions by using space technology and data'* (ibid).

However, as the response of the Herefordshire-based farming family shows, realising such efficiency gains through new technology-based governance applications is not as straight forward as it may sound. Some of the satellite images had highlighted – in bright red colour –

various features on the family's farm which questioned the legitimacy for direct payments. According to EU regulations farmers can only claim direct payments for productive agricultural land. Thus, any unproductive assets need to be deducted from this area-based payment scheme. This includes, for example, ponds, hedgerows, and fenced-off areas for wildlife. In this case some of the images also questioned legitimate – and indeed productive – farming practices such as the use of strawbales and ring feeders that were used for feeding cattle during winter and which happened to be picked up during the audit by the Sentinel-1 satellites. Unsurprisingly, the unannounced audit and attached satellite images caused a lot of trouble for the farming family who did not want to lose any of their direct payments. The husband (in his early 50ies) became aggravated and too stressed to respond, which left the wife with this ungrateful task. She resorted to pen and paper and compiled her own hand-

³⁸ The visit and interview took place at the family farm of the key informant on 25. November 2016.

drawn maps with detailed information, explanations, and justifications as to why some of the questioned and highlighted areas shown on the satellite images were indeed eligible for direct payments.

This case highlights three lessons that are important for our arguments. First, the clash between a government body's digital enquiry and a farmer's analogous response shows the unequal access to digital technologies which may reinforce uneven power relations. This problem is particularly severe in rural-based industries such as agriculture where the digital divide remains a key issue for agribusinesses (Bowen and Morris, 2019). Second, the example reveals the very different means of how people know and see the world. The officer(s) of the Rural Payments Agency charged with the audit had to rely solely on satellite images with all their benefits but also with limitations in resolution and in lacking intimate, local knowledge. The farming wife on the other hand had to solely rely on the latter knowledge to justify why a blurry feature on a satellite image was indeed a ring feeder and not a pond. Third, this example also shows some of the absurdities of bureaucracy in the sense of the costs that are going into this type of surveillance work and which are not likely to be recovered. At least in this case the payments in question were in the region of a few hundred pounds, but it still required time and staff resources to sit down to produce the maps, the letter and after that deal with any further correspondence. The explanation we were given as to why this was still worthwhile to pursue was that the UK government wanted to avoid any penalties for breaching EU regulations. This was an issue in previous years and thus officers were reminded and encouraged to check very meticulously for any breaches and to make ensure that the 5 % threshold was being met.³⁹

5.4.2 Soil Patrol: Using live data to make sense of a diffuse problem

The second example of everyday digitalisations draws on interactions with actors involved in tackling the problem of diffuse agricultural pollution on the English side of the Wye catchment. Here, a pilot project called Soil Patrol had been trialled in 2017. This project was initiated by the Environment Agency [EA] to address the phenomenon of topsoil being washed away from farmer's fields into the river Wye and its tributaries during rainfall events especially over the wetter winter months. Such soil and associated nutrient losses significantly contribute to the deteriorating

³⁹ Interview with SB, regulatory body, 2 March 2017.

status of water quality within the river catchment (Withers et al., 2022), which has become a public concern and a political problem that is now experiencing regular media attention (e.g. Monbiot, 2022).

Through Soil Patrol the EA tried to combat this problem by resorting (once again) to earth observation technologies in combination with ground truthing to identify high risk fields and potentially take enforcement actions where diffuse pollution could clearly be witnessed and attributed. The exact process of how this was done was documented by the EA's Environment Manager for Herefordshire and Worcestershire on his personal blog (Throup, 2017) and in a series of Twitter posts shown below (Figure 15).

Soil Patrol involved:

- a) the selection of a focus area with the help of satellite imagery and LIDAR data,
- b) site visits of 50 pre-identified fields conducted by Environment Officers after a rainfall event,
- c) the use of handheld tablets and a bespoke GIS-based application to collect and share evidence of diffuse pollution in real-time (incl. text, pictures, and videos),
- d) a field-based risk assessment and confirmation of polluting fields, and
- e) the subsequent notification of the respective landowners.

According to the EA's Environment Manager the results of this pilot project were very promising. Environment Officers were able to identify high-risk fields, document actual diffuse pollution incidents, and the technology-aided targeting system did not miss any other high-risk fields in the selected focus area.

'Perhaps the most encouraging aspect of the technology (in addition to its accuracy) has been the reaction of our staff who are using it, several remarking it's revolutionising the way they're working and making their job far more productive and rewarding.' (Throup, 2017)

Unsurprisingly, Soil Patrol was not discontinued after the trial. It was repeated in the following years and is now part of the repertoire of operational activities that allow the EA to better target their site visits.

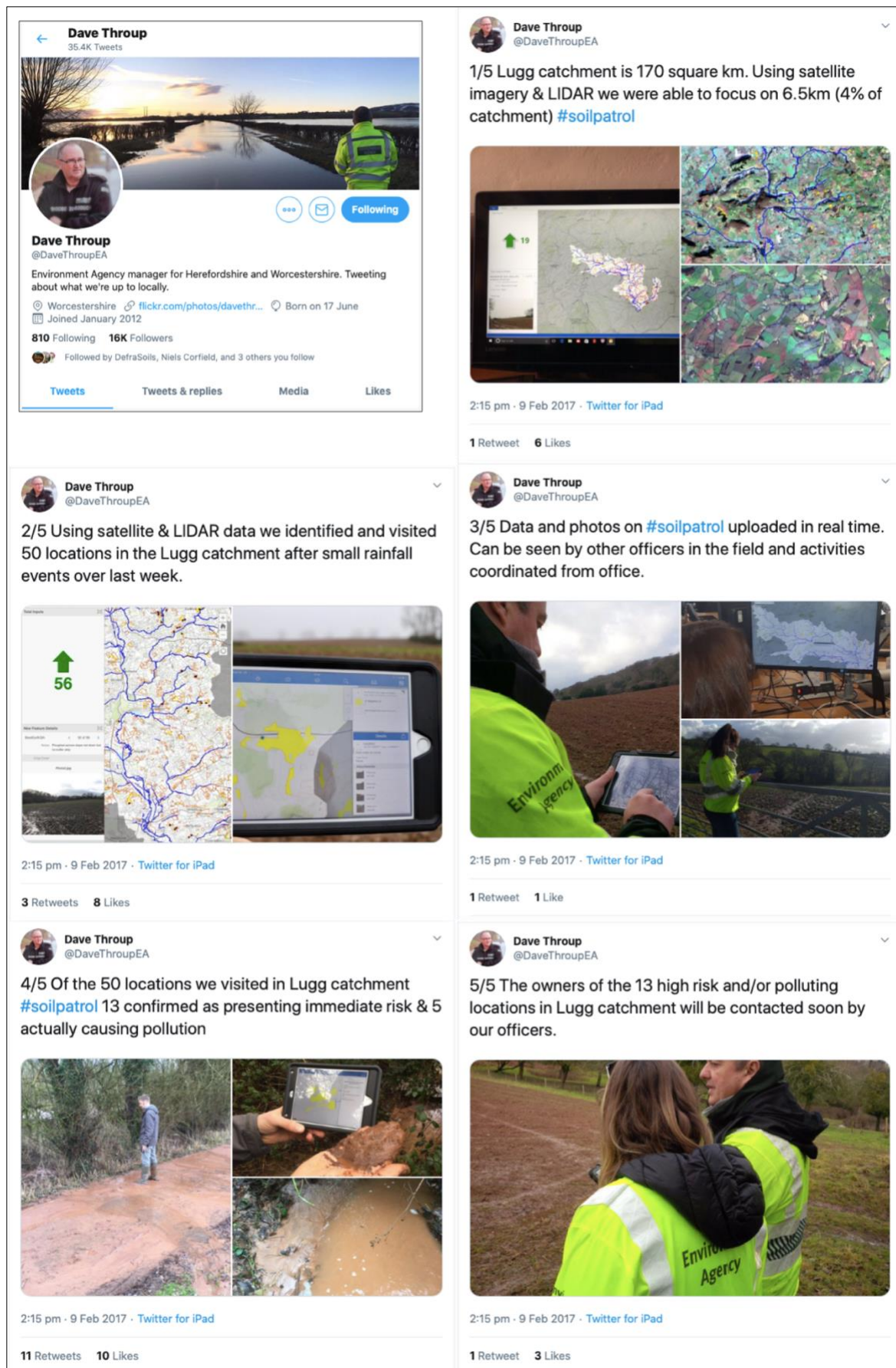


Figure 15: The steps involved in Soilpatrol as documented by the EA's Environment Manager on Twitter, 9 February 2017.

Source: Twitter

Overall, this example reveals three noteworthy insights about everyday digitalisations in agri-environmental governance. First, it highlights the hopes that people connect with digital technologies in helping them to fill knowledge gaps and to make better sense of everyday problems such as diffuse pollution.

Tackling the problem obviously involves finding out where the polluting runoff is coming from. This sounds simple but isn't! River and stream catchments (the area of land that drains into them) are large. Often the runoff originates quite a distance from the polluted river or stream, finding its way by gravity via roads, paths, ditches and other fields. Also agriculture is a highly mobile industry. What is a bare arable field one year might be pasture the next, so the locations of high risk move around. To help us find the needles in the haystack we've turned to modern technology. And it's working. (Throup, 2017)

Second and diametrically to the above, the example also shows the hopelessness of the problem situation. Soil Patrol only managed to focus on 6.5 km² of a sub-catchment during a working week because ground truthing remained essential in gathering evidence that is sound and useful for enforcement and regulatory work. Compared to the total size of the Wye Catchment (4,285 km²) scaling-up this approach then appears like a herculean task that would require considerably more time and many more boots on the ground – two things with which the EA is usually not blessed when responding to pollution incidents. This serves as an important reminder that the application of (digital) technologies relies on people and their resources. Without ground truthing the live data provided by the satellites would have been meaningless. The connections between data, technology, rainfall, soil loss and place had to be made by people on site to become meaningful and accountable.

Third, this case calls attention to the role of trials or pilots in helping to “projectify” and stabilise potential pathways of sociotechnical imaginaries (see also Forney and Dwiartama, 2022). Such projectifications of potential agri-environmental governance futures are crucial because sociotechnical imaginaries not only need to be articulated, but also constantly performed to gain and retain their powerfulness and political clout. In this sense local initiatives like Soil Patrol are crucial as they test new ground for wider sociotechnical imaginaries.

5.4.3 Glastir: Determining scheme priorities and farmer participation through digital mapping

The third example of everyday encounters with digitalisation builds on the personal account of an organic farmer based in the Brecon Beacons National Park who was trying to access Welsh Government's current agri-environment scheme Glastir when it was first launched in 2012.⁴⁰ This self-proclaimed '*scheme-minded farmer*' (KD, farmer) had participated in the previous Tir Gofal scheme for 13 years, but was unable to access the new Glastir scheme '*because their [Welsh Government's] mapping strategy wasn't interested in what we had on the farm*' (ibid.). What the farmer alluded to here was a mismatch between the environmental habitats and goods that were produced on his farm and the strategic and specific targets of the new scheme. This mismatch goes back to the design phase of Glastir which involved the development of 130 target maps that combined spatial data sets from WG and other '*expert Partners*' including government bodies such as the Environment Agency Wales, the Countryside Council for Wales, or the Forestry Commission as well as private and third sector organisations such as RSPB, Butterfly Conservation, Bat Conservation Trust, and Welsh Water (Humble, 2012). The co-produced target maps informed the specific priorities of the new scheme (see Figure 16 for one example) and provided the basis for a scoring system that ultimately determined farmers chances to be selected by Welsh Government to deliver the Targeted Element of the Glastir scheme.⁴¹

In this context, the sociotechnical imaginary driving the design of Glastir was the government's desire for a stronger – and arguably a more democratic – evidence base to better target the delivery of desired agri-environmental outcomes. As such it is a direct response to earlier schemes which have been critiqued on those very grounds (Austin, n.d.). By sharing information and existing datasets across organisations and by compiling digital representations of priority hotspots the hope was that Glastir would deliver more bang for the public buck.

⁴⁰ The interview took place at the farmer's home on 18 April 2016.

⁴¹ Glastir also contained lower level agri-environment schemes namely an All Wales Element and a Common Land Element. In order to be eligible for the higher level Targeted Element of the scheme farmers needed to be part of either of those two lower level agri-environment schemes.

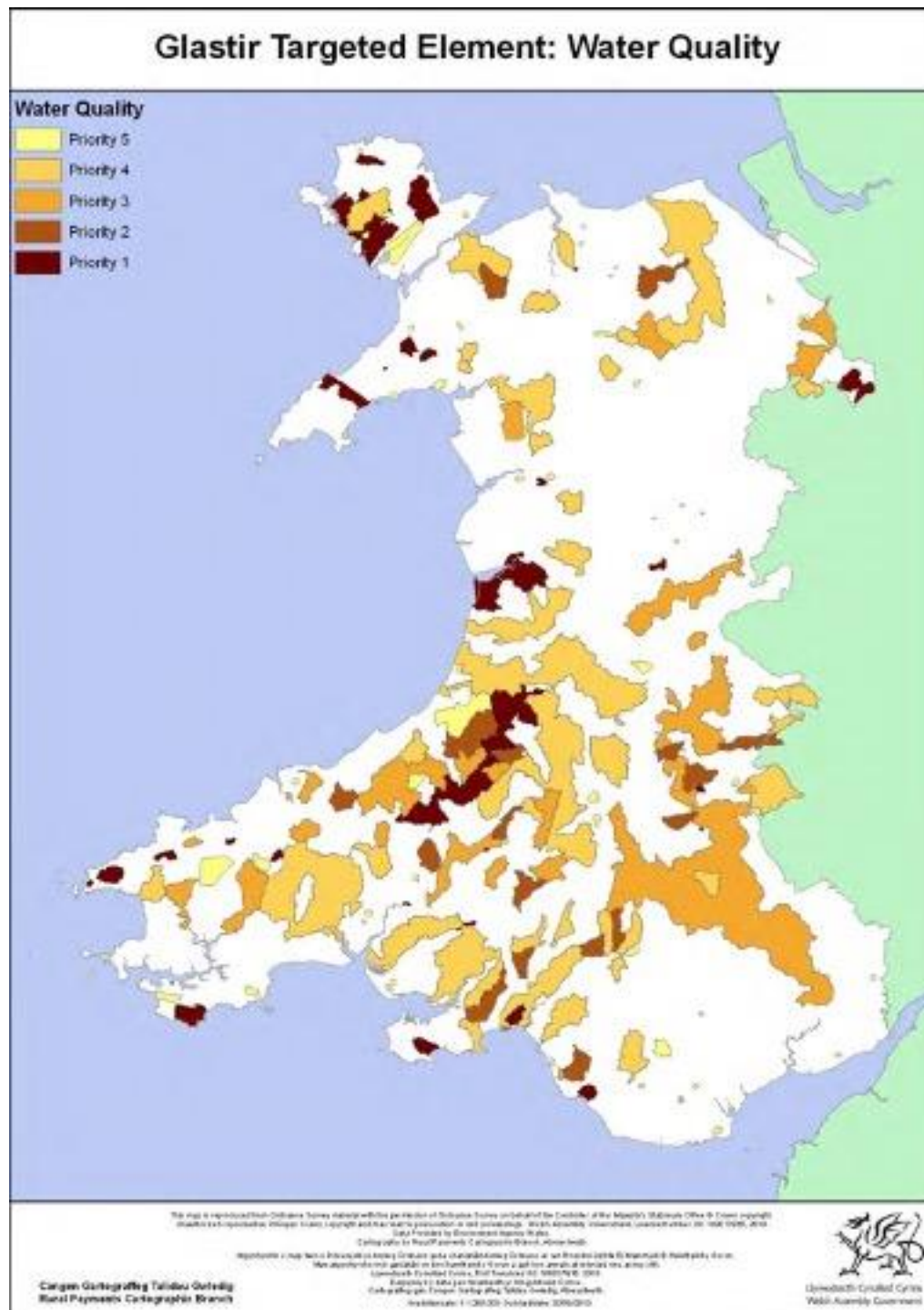


Figure 16: Glastir Targeted Element map showing different priority areas to deliver for water quality.

Source: Humble 2012.

However, the flipside of this collaborative digital mapping and targeting approach was that farmers outside of priority areas scored very poorly and were effectively excluded from participating in the higher-level scheme. In the case of the above-

mentioned farmer this had direct implications for the farm business and the environment:

‘When I didn’t get in, I rung Welsh Government and said right: This £250,000 worth of taxpayer’s money [the amount that had been invested into his farm through the previous Tir Gofal scheme] is going to be ripped up. And I purposefully went down and ripped all my streams and corridors up and I took Tir Gofal fences down and allowed all stock into woodlands and said if you’re not going to value them [...] if you want not to pay for these products, I will produce food of them. And I will make an example of how not to look after an environmental farm, which we were. [...] I got my permissions to plough it all and I did. I ploughed it all back up. So you know, stupid I thought. Very, very stupid. You know, they paid for all this stuff. I was willing and happy to put it back in, but they didn’t value it. So, you don’t value it, I needed it back in food. I needed to make a living. So, we flipped and became a very productive organic farm. (KD, farmer)

As we have argued elsewhere (Wynne-Jones and Vetter, 2018), this third example shows that the digital Glastir target maps *‘authorise particular sets of knowledge while inevitably excluding others who do not have the capacity to relay information in the necessary format’*. In this case, organisations who have contributed to the design of the new Glastir scheme were at an advantage as they had access to resources and GIS software to submit their evidence from existing studies, surveys or project work in the form of GIS layers and maps. Again, this example then points towards the potential for digital exclusion for all those who do not possess the same capabilities or who cannot take proactive measures to respond to (or rather anticipate) the impacts of digitalisation of agri-environmental governance. This last point was also recognised by the farmer who admitted:

If I had been smarter and realised we were going to be up in this problem, I would have pulled RSPB in to do a bird count on my farm. Because we have hundreds of them. Three, four hundred birds flying about all this habitat land, but nobody recorded it, nobody was there, so it did not show up on a map. You know, they [RSPB] fed in their reports and maps and so did the water pollution guys, NRW, National Parks. They were all allowed to feed in, but [...] we didn’t exist. (ibid.)

The importance of digital and visual representation – and the problem of non-representation – becomes obvious in this context and has motivated the farmer to reapply for the scheme after adopting various farming measures that were likely to improve his scoring position (e.g. introducing bee hives).

Beyond such personal trajectories this example also demonstrates the *‘new collaborative arrangements’* (Ingram et al., 2022) that characterise everyday

digitalisation processes in agri-environmental governance. The interrelations and interdependencies between different actors, (expert) knowledges, datasets and data models affect what counts as evidence in an increasingly digitalised governance world, albeit being imperfect, incomplete, and always in the making.

5.4.4 The PFLA Google Group: Tapping into the digital/manual farming wisdom of the crowd

The last example of everyday encounters with digitalisation draws on the main authors netnography of the Pasture-fed Livestock Association (PFLA) (Vetter, 2020). The PFLA and its members work towards the socio-technical imaginary of purely pasture-fed livestock production systems and clearer food labelling for UK consumers. As such this imaginary constitutes a counter vision for an agricultural sub-sector that has come under closer public scrutiny due to a range of unsustainable practices and trends that characterise mainstream meat and dairy farming (e.g. intensification, reliance on concentrated feeds, decline in grazing, indoor housing). At the heart of the PFLA stands an online forum – a Google Group – which has helped to connect and unit like-minded farmers and other allies (such as butchers, farm advisers, researchers, consumers) in this endeavour. From the beginning this forum has proven critical in coordinating joint actions and in developing a supportive community of practice that encourages information sharing and peer-to-peer learning. Today the forum has grown to 941 members and contains 4266 archived postings,⁴² which can be accessed by members at any time. Indeed, tapping into this collective wisdom, obtaining advice from fellow practitioners, and sharing experiences about the intricacies of pasture-fed farming has become a daily digital routine for many members, and it continues to be a major selling point that drives other farmers to join the association.

While we have documented the specific nature of peer-to-peer learning within the PFLA elsewhere (Vetter, 2020), in the following we illustrate how the online forum also acts as a filter and tool for critical reflections about digitalisation. Making ruminant livestock farming systems work on pasture alone can be highly technical, and thus unsurprisingly the forum has been used frequently for discussions and opinion sharing about digital technologies and innovations. This included, for example, GPS controlled virtual fencing (e.g. NofenceTM), various stock and grazing management apps, or robotic milking systems. Another recurring topic are plate

⁴² As of 8 August 2022.

meters which are used to measure grass growth and productivity, and which can help farmers with forage planning and grazing management. Plate meters have been discussed widely with many contributors carefully reflecting upon the pros and cons of manual versus digital versions. For example, in response to a farmer asking for plate meter recommendations, another one responded:

'I bought the simplest and cheapest one possible [...] It has a manual counter on the plate and a counter on the handle. You have to record start point and end point from the plate and click the counter on every plonk. It works fine. I am in the swing of using it now. The main drawback is getting a wet notebook whilst recording. My thinking: 1. Plate meters are a ridiculous price. I did not want to spend a huge amount of money that something that may end up in the cupboard (although it hasn't). 2. I applied a rule from my software development days of only automating things when you are really really bored of doing them by hand. I wasn't clear how much time / annoyance the extra features on the plate meter were going to save me. 3. I wanted to get the data into agrinet.ie. So connections to proprietary software made by the plate meter providers was not attractive. When I looked at the whole value chain it was better to spend money on the agrinet subscription (including their grass on phone system).

Such practical and economic considerations motivated another farmer to take to the forum and share the plans (Figure 17 and Figure 18) of a low-cost DIY plate meter that he had developed together with his brother:

Hi Folks, Plate meters seem to be mentioned quite alot lately so I have enclosed some plans to make your own. Should take you under an hour and you may even have all the bits already around [...] My brother is the clever one who made these. To call him "tight" would be a dis-service, he's just very choosy about what he spends his money on, and hundreds of pounds on a plate meter at our current stage was never going to happen when the shopping list is so long. He also likes to just get on with stuff and recycle things. We have both been separately using these for a month and a half and successfully allocating 1, 2 and 3 day areas for groups of 50 cattle, and generally leaving the residuals that we require. In fact the day I "eyeballed" an allocation I got it seriously wrong, as I hadn't realised how sparse the sward was, and they turned the area into a bowling green. In my tests its seems as good as a sward stick and clipboard, but less bending down, and faster [...]. Enjoy! Andy

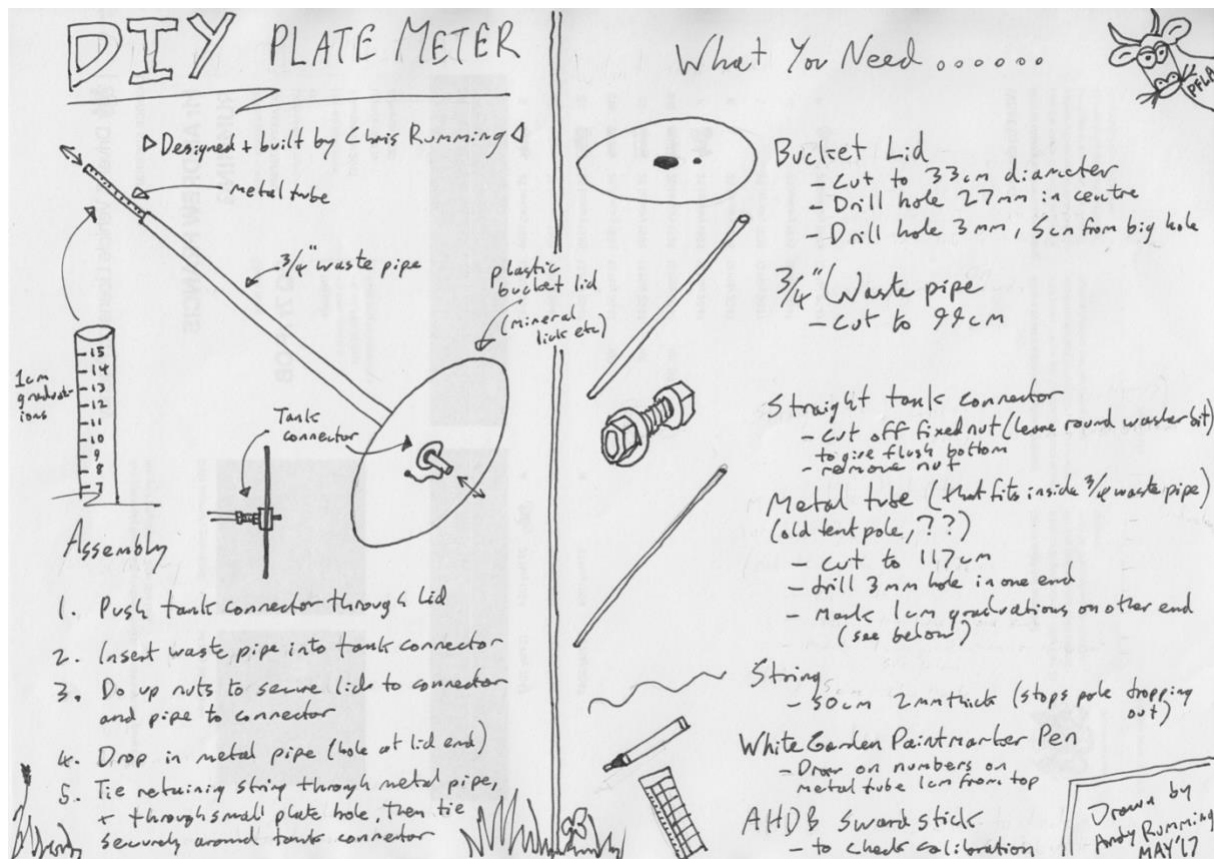


Figure 17: Page 1 of the DIY plate meter plans shared within the PFLA forum.

Source: PFLA Google Group.



Figure 18: Page 2 of the DIY plate meter plans shared within the PFLA forum.

Source: PFLA Google Group.

Such interactions suggest that farmers make careful sense of the wide range of digital tools and gadgets that are available to them. Even though the PFLA comprises many tech-savvy farmers, they would rarely jump at new products and innovations uninformed. Thus, this final example supports the view that digitalisation (as in general any other innovation) relies on negotiations between people and between a farmer and his or her own farming practices and individual needs. If, as in this case, a digital innovation does not justify the added cost, or indeed an old, but retro-fitted technology does provide similar insights, then digital products may not be the immediate choice. This does of course not necessarily mean that farmers oppose or reject digital solutions, but they need to make sense and add value to the farm. As such the PFLA forum helps to inform farmer's decision-making differently. For those who engage it can broaden and sharpen this process through access to meaningful advice and the experiences and opinions of peers.

5.5 Discussion: Altering options and choices for knowing and decision-making

Digital agriculture and by extension digitalising agri-environmental governance '*is neither good nor bad, in part because [...] what "it" is must be understood as variable, contingent, and diverse*' (Carolan, 2022). Paying close attention to everyday digitalisation and to the sociotechnical imaginaries which are shaping the former can help with eliciting this variability, contingency and diversity. What then becomes obvious are the altered options and choices made available not by digital technologies *per se* but by the '*intersections with established modes of knowing and decision-making*' (Ingram and Maye, 2020, p. 1). In other words, agri-environmental governance practices and knowledge are not revolutionised by digitalisation, but they evolve through the messiness of everyday life and through the piecemeal breakup or reinforcement of more dominant sociotechnical alignments.

Such intersections between digital and established modes of knowing and decision-making have emerged as a cross-cutting theme in our analysis above. They can be challenging and frustrating as both the farming family's analogous response to a satellite-assisted audit (1. Example) or the Welsh farmer's destructive reaction to the rollout of a digitally revised agri-environment scheme revealed (3. Example). These two examples confirm earlier raised concerns in the literature about deepening digital divides and the potential for digital exclusion (Bowen and Morris, 2019; Ingram et al., 2022), and thus strongly support views that see a need to address power

imbalances and inequities also within the realm of agri-environmental governance (Klerkx et al., 2019). Based on our insights we can add to this agenda the resolution of knowledge inconsistencies and discrepancies. These can derive from remaining limitations of digital technologies such as poor visibility on satellite imagery used for monitoring CAP payments, or from choosing specific actors and datasets for spatial targeting of agri-environmental measures as seen in the Glastir scheme. In the latter case the benefits of spatial targeting must not only be weighed against the trade-off of restricting participation and risking alienation both in the design and the delivery phase (Ehlers et al., 2021), but also against the limitations of such digital representations. As any digital technology, Geographic Information Systems *‘always involve a translation of the complexity of the world into computable digits, highlighting that what can be counted counts. This translation thus necessarily involves certain “black boxes”* (Kloppenburger et al., 2022, p. 234), or – as implied by our Welsh farmer – certain “cold spots” of biodiversity which may not have been surveyed or monitored for whatever reason. While there are good and valid reasons that support more targeted approaches of agri-environmental schemes (Reed et al., 2014), the *‘new collaborative arrangements’* (Ingram, 2008) informing this process need to become much more scrutinised. Just like technology, collaboration and targeting are not neutral processes, they are highly political. Hence the actors involved, their vested interests and interdependencies, the evidence provided, and models used, the options discussed, and the choices made all need to become much more explicit and transparent, and moreover they need to be explained appropriately to those who are eventually affected.

Beyond such challenges the intersections between the digital and the non-digital can also be productive and motivating as the two other examples have shown. From the civil servant’s perspective (2. Example) we could hear how digitalisation can be effectively combined with long established modes of knowing (including observations from site visits) to aid peoples’ understanding about complex agri-environmental problems and to better act upon them (at least potentially). This example is particularly noteworthy as it clearly demonstrates the interdependencies between different modes of knowing and decision-making. In fact, any single mode of knowing appears weak and relatively pointless to base any decisions on in the context of agricultural diffuse pollution, but digital and non-digital modes of knowing appear stronger and more useable through their combination and specific

assemblage. Herein lies great potential as digital modes of knowing can complement established modes of knowing (and *vice versa!*) and make previously unseen things visible to help close or narrow existing knowledge gaps. However as Kloppenburg et al. (2022, p. 234) recently pointed out: *'Digital technologies do not simply make more things visible and therefore more effectively governable; they also shape what is made visible and how'*. In this case run-off from bare fields which are more prone to soil erosion are made visible, but the role of other factors that are contributing to deteriorating water quality within the Wye catchment, including the high nutrient input pressure from intensive livestock farming (Withers et al., 2022), remains obscure and unaddressed. From a critical perspective then this trial largely helps to stabilise dominant sociotechnical imaginaries which see no need for questioning clearly unsustainable food production and consumption patterns. To be clear, this is not necessarily the intention or hidden agenda of the protagonists behind Soil Patrol, but a consequence of the structural conditions under which this Environment Agency trial takes place. As Ehlers et al. (2021, pp. 1–2) explain more broadly on this point:

'the policy instruments and implementation technologies currently applied are largely aligned, as choices and design specifications of agricultural policy instruments are restricted to what is deemed feasible considering dominant discourse, political constraints, administrative resources and technology'.

Lastly, even in situations when certain digital solutions may become rejected (4. Example), do the intersections between the digital and the non-digital provide impetus for critical reflections for how people know or (perhaps more precisely) choose to know. While we could have presented very different examples showing PFLA farmer's uptake of other digital aids, conversations such as the one about plate meters shows that digitalisation is not a one-way street; it's much messier and complex. It can include fallbacks on manual solutions that are deemed better value, or indeed lead to DIY solutions. This corroborates recent findings by Rose (2022, p. 14) who argued that *'whilst new technologies do replace the old, old technologies can replace the new, and retro-innovation or micro-invention can reinvigorate older items'*. How this plays out depends on the individual circumstances, but of course also on the specific communities of practice or knowledge networks in which people are embedded (Ingram and Maye, 2020; Vetter, 2020). For farmers online fora like the PFLA's Google group can provide opportunities for social learning based on knowledge exchange and sharing of first-hand experiences, and as such they can act and indeed be used by its members as a filter to make sense of the multitude of both

digital and non-digital technology developments. Herein, also lies an intriguing field for future research, namely if and how such online interactions in turn help to re-shape the direction and further development of technology innovations or governance practices. These are pertinent questions particularly in cases where membership of such knowledge networks is not limited to farmers, but open to other stakeholders including technology developers and public bodies.

5.6 Conclusions

In this article we have explored the question how digitalisation transforms the configurations of agri-environmental governance by drawing on four concrete examples of its everyday manifestations in the UK. First, we found that the interplay between sociotechnical imaginaries and everyday digitalisations has practical consequences and indeed important epistemological implications for everyone involved, and on all levels of agri-environmental governance – including the public and private sector, as well as planning and design, control and enforcement, and peoples' decision-making. These consequences and implications of digitalising agri-environmental governance can be challenging especially when digital modes of knowing and decision-making clash with more established ones. However, they can also be helpful particularly when different modes of knowing and decision-making are creatively combined to further knowledge and understanding. In any case though digitalisation trends remain problematic and they are highly political as they affect important dimensions of governance including *'seeing and knowing, participation and engagement, and interventions and actions'* (Kloppenburger et al., 2022, p. 232).

Second, this leads us to argue that the intersections between digital and non-digital modes of knowing and decision-making deserve much closer attention by social scientists, as it is here that new options and choices either open up or close down through different imaginaries and alignments. Indeed, other critical social science concepts such as assemblage theory could be productively employed to shed more light on the specificities of (re-)assembling different modes of knowing and decision-making including the options and choices of technologies, data models, evidence, human and non-human actors, and so forth. Such research is needed to better understand the challenges and opportunities that these assemblages have at the social and societal level as it is paramount to render the processes of everyday

digitalisation visible to avoid the naturalisation and depoliticization of such technologies and processes.

Lastly, future research should continue to gather more diverse accounts of everyday experiences with digitalisation. Our study was limited in scope and structure, and it was primarily informed by farmers' lived experiences with digitalisation. But there is an obvious need to move beyond the farm-level to capture the experiences of other agricultural key actors who also enact and shape various digitalisations within agri-environmental governance. While some attempts have been made to qualify the implications of digitalisation for the Agricultural Knowledge and Innovation System (Fielke et al., 2020), much more empirical work is needed for example about everyday digitalisation as experienced by government or regulatory bodies. Ethnographic and other qualitative research approaches have an important role to play in this regard as they can help elucidate under which circumstances and conditions digitalisation truly leads to qualitatively different knowledge and better governance decisions.

Part III: Concluding discussion

Chapter 6 – The lessons learnt from studying everyday practices and transitions in UK AEG

The main objective of this thesis was to draw a more comprehensive picture of multiplicity in UK AEG based on an ethnographically informed analysis of governance practices and transitions. To do so, I have documented and analysed the mobilisation and social uses of four specific AEG instruments in a series of research papers covering different geographical contexts and theoretical angles. The first paper (Chapter 2) drew attention to payments for ecosystem services [PES] and the practices used to inspire market-style transformations in Welsh AEG. By employing Murray Li's (2007) practices of assemblage we could show how a mosaic of different PES arrangements has emerged which serves and reflects diverse interests and needs. The second paper (Chapter 3) critically engaged with the principles of partnership working to combat agricultural diffuse pollution in Herefordshire. Through the lens of Sheila Jasanoff's (2004) instruments of coproduction this paper showed how farmers were proactively nudged towards better land management practices by a multi-actor partnership via their collective attempts to re-shape identities, institutions, representations, and discourses. This partnership work produced place-based versions of good farming which seek to reconcile rather than divide profitability and ecology in farming. The third paper (Chapter 4) investigated the establishment and ways of working of the Pasture-fed Livestock Association, a UK-wide food label and farmer-driven organisation committed to grain-free livestock production standards. Using Lave and Wenger's (1991) situated learning theory this case study demonstrated how a private food label can also act as a community of practice stimulating social learning and unlearning between its members through virtual and non-virtual means of engagement. The empirical material of this paper generated novel insights about the role that such communities of practice can play in bringing marginalized practices, knowledges and products to people's minds and markets. Finally, the fourth paper (Chapter 5) explored and contrasted socio-technical imaginaries (Jasanoff, 2015; Jasanoff and Kim, 2009) of digitised agri-environmental governance with the challenges of implementing these technologies in everyday contexts of various governance stages and actors. This final paper revealed how various digitalisations both transform the configurations of agri-environmental governance practices and agri-environmental knowledge in challenging and productive ways. Despite this diversity in empirical and analytical scope – or perhaps

precisely because of it – there are several transversal conclusions which can be drawn from this research project. In this concluding discussion I will return to the overarching research questions set out in Section 1.3 and reflect upon the lessons learnt from this thesis.

6.1 The value of uncovering everyday governance practices

In relation to the first overarching research question, I wanted to explore what a distinct focus on everyday practices can teach us about the mobilisation and social uses of new AEG instruments. Across all four papers this thesis has shown that such a perspective allows us to uncover the diverse motivations to mobilise new AEG instruments as well as the hard work and mundanities which are required to turn them into meaningful governance practices. In marked contrast to most contributions to the AEG literature I have employed an ethnographic research approach which has shown significant potential to refine our understanding about the possible discrepancies between AEG design and AEG practice. This approach allowed me to scrutinise conceptualisations of governance which tend to be stabilised through public discourses and academic theorisations. By attending to everyday tasks and events as lived and experienced by a variety of governance actors, I was able to show how various AEG instruments are used, translated and moulded into specific arrangements, practices and outcomes. For instance, the analysis has shown that neither PES (Chapter 2), nor partnership working (Chapter 3), or digitalisation (Chapter 5) have been imposed unidirectionally by any overarching entity. Such governance instruments, including any associated tools and technologies, are purposely selected and proactively used by a multitude of actors including those who seek to govern (e.g. government, eNGOs) and those who allegedly sit passively at the receiving end of governance (e.g. farmers). Thus, as much as AEG instruments may serve new and very specific objectives – as suggested by their terminology or original intent – they tend to be used for very different purposes reflecting both the shared and individual agendas of the actors involved. The resultant uses therefore do not follow any pre-defined or identical schemata, but instead create opportunities to (re)negotiate new and old concerns including long-standing and structural problems such as market failures, rural development issues, regulatory resource constraints or farm business viability. In short, concrete governance arrangements are determined by people's everyday realities. These are shaped by many different factors, including

place-based problems, available resources and skill sets, but also by pragmatism and indeed idealism to contribute to positive change whatever this might mean or entail for the individuals involved.

In direct relation to developing these concrete governance arrangements is the hard work and mundanities that come with it. Both of these aspects are not adequately thematised in AEG research and practice even though considerable efforts, time and resources are necessary to devise meaningful AEG practices. Such meaningful practices are needed to fill AEG instruments with life and to realise any outcomes. For example, partnership working does not function just like that, at least not very well. It took the organisations involved in Farm Herefordshire many meetings and conversations to agree on the partnership objectives, branding and the wording of the key messages (Chapter 3). In the case of the PFLA innumerable volunteer hours have been put in by individual members to build the evidence base and to get the association off the ground (Chapter 4). Similarly, the topic of PES has now been around for more than 10 years, not because it is a sure-fire success that allows people to follow a blueprint, but because different actors like the ones in Pembrokeshire mobilise it again and again in the hope to arrive at practical means to finally deal with a problem that has been in the making for a very long time (Chapter 2). The hard work and mundanities of AEG were also visible in the contexts of everyday digitalisations (Chapter 5) – be it the farming family's fight with pen and paper against satellite images and bureaucracy, or the considerable efforts that went into the EA's live data trial. This part of AEG tends to be disregarded or omitted in the literature even though it reveals much about the social life of *doing* governance. Moreover, it raises important questions about different forms of labour and resources required to do governance on a daily basis, and which may not always be taken into account when designing new agri-environmental instruments, schemes and policies.

6.2 The changing power relations and knowledge regimes in AEG

The focus on everyday governance practices has inevitably also revealed important insights in relation to the second overarching research question, namely how AEG practices change power relations and knowledge regimes. We have learnt that small politics are part and parcel of mobilising and implementing new AEG instruments, as well as showing one's resistance to specific uses or applications. For example, partnership working assigns specific governance roles and functions and thereby

enables some partners to play more powerful roles than others. This included the prioritisation of certain environmental problems, interventions, and funding options made possible only by the provision of datasets and evidence held by private and third sector organisations (Chapters 2 & 5), or the setting of agendas by key individuals who possess specific skill sets, knowledges and personal relationships (Chapter 4). On the other hand, the deliberate destruction of publicly funded habitat in response to being excluded from the reformed Welsh agri-environment scheme Glastir was as much an act of frustration as it was a political statement of resistance – never mind how *‘stupid’* it seemed even to the respective farmer (Chapter 5). As in the case of the hard work and mundanities involved in AEG these small politics also tend to be overlooked in AEG research and practice despite them having clear influence over governance practices and outcomes.

Beyond such small politics, bigger politics have also surfaced in this thesis. These bigger politics revealed peculiar tensions between clear politicisation of UK AEG on one hand and efforts of depoliticisation on the other. Whilst assembling PES in Wales or adopting the partnership principle in Herefordshire can both be seen and understood as ways of depoliticising contentious agri-environmental problems – for example through technical foreclosure or normative pretext – a closer reading suggests a much more complex picture. In this latter picture power relations continue to shift because of the opportunities that now exist for new types of actors to directly get involved in AEG. Thus, consensus building, forging alignments between different agendas and objectives, or the agreement on a non-confrontative delivery approach are, of course, inherently political and determined by those who sit around the partnership table or on PES project steering groups. In contrast to these examples of shrouded politicisation, the PFLA provided a much more overt example of politicisation (Chapter 4). In this case it becomes expressed in the farmer-driven calls for clearer food labelling. Here, a policy and regulatory gap has been identified which remains disputed by government and agrifood industry organisations. However, through the active enrolment of strategic allies including politicians, scientists, and consumers this may now slowly begin to change. As such this corroborates earlier findings about shifts in authority over environmental morality between agriculturalists and environmental groups (Lowe et al., 1997). These contestations are still alive and ongoing, but they are also qualitatively different: Today, we have environmental groups working very closely alongside agriculturalists and industry bodies, and we

have farmer-turned-activists (and activist-turned-farmers) demanding much more stringent environmental standards. This says a lot about the trajectory of AEG in the UK over the past few decades, how far we have come in dismantling oppositions and dichotomies between food production on one hand and environmental conservation on the other, and indeed in constructing new representations of what different parts of society now perceive as good and bad environmental forms of farming.

Closely aligned to changing power relations is the topic of knowledge, which has featured significantly throughout all papers. This shows that a large part of doing governance is knowledge work (De Wit and Iles, 2016; Jasanoff, 2004; Murray Li, 2007), and hence understanding the co-production, dissemination, and contestations of different sources, sets and types of knowledge is critical if we are to better understand and influence the transitions that AEG is taking. What stood out in this context were three interrelated aspects. First, we found that new AEG instruments exhibit authorising capacities which allow the protagonists who are involved in their mobilisation to renegotiate what counts as knowledge. This has been particularly obvious in the case of the GIS maps used to inform the Welsh agri-environment scheme Glastir (Chapter 5), as well as the efforts put into legitimising the PFLA's community knowledge (Chapter 4). Second, for knowledge to count we have seen that it must be evidenced and made relatable and relevant to different target audiences. For this purpose, different types of knowledge were deployed. For instance, making farmers' sticky knowledge available and accessible to peers was relevant in both Farm Herefordshire and the PFLA (Chapter 3 & 4), albeit at very different intensities. Similarly, the formation, articulation and circulation of explicit knowledge played a crucial role in defining governance boundaries and territories, and in justifying AEG norms and practices more widely including towards the public. Third, through such knowledge work distinct pathways to governing agri-environmental problems and change open up, which advance certain elements and interests in AEG networks including specific farming practices, topics, participation, and imaginaries of order (among many other things). This helps to explain, for example: the enrolment and endorsement of *'the good guys'* (Wheeler et al., 2018) who are doing the right things already – at least in the eyes of the Farm Herefordshire partners, the promotion and scientification of specific grazing regimes such as mob grazing in the case of the PFLA, or the frequent references made to topics like soil health or digitalisation which are believed to be game-changing not

only environmentally speaking but also from a farm business or regulatory perspective. Conversely, then, paying attention to such knowledge work also shows that it is always selective and incomplete, which serves as an important reminder that other aspects and alternatives may get ignored (cf. Kloppenburg et al., 2022). It is here, where I believe that social scientists have a key role to play and a responsibility to fulfil, which lies in interrogating these knowledge processes more carefully and critically to find out *who* and *what* is getting in, and in turn *who* and *what* is being left out as new AEG directions form and change.

Alongside the knowledge work in specific AEG networks emerged interesting questions and insights especially around farmers' learning processes. While it is now well established that more sustainable farming practices are knowledge intensive and dependent on specific types of knowledge including sticky knowledge (Carolan, 2011; Goulet, 2013; Šūmane et al., 2018; Triste et al., 2018), this thesis has shown that learning cannot simply be reduced to new knowledge acquisition and cognitive work carried out by the individual. It is a complex social undertaking which requires from those who chose to partake to also break with past practices, beliefs and convictions in order to deal with the everchanging nature of knowledge development and life-long socialisation. Whilst this other side of social learning was particularly prevalent in the case of the PFLA (Chapter 4), I would argue that it was also evident in the other cases. For example, promoting better land management practices in Herefordshire through farm walks, videos and leaflets required from the participants, viewers and readers a critical and reflexive engagement with what is good and what is bad about land management practices. Thus, ultimately the Farm Herefordshire partnership activities aimed at unlearning dominant practices as much as they encouraged learning about new or different practices (Chapter 3).

As I have argued in Chapter 4, I believe this social dimension and transformative potential of unlearning deserves explicit recognition and wider application in AEG research and practice (see also van Oers et al., 2023). Many AEG measures, whether they are part of public agri-environment schemes or private production standards, involve not doing certain things or unlearning previous practices (e.g. no-till cultivation, leaving wider field margins uncultivated, introducing fallow plots, reducing or eliminating synthetic/external inputs). Yet, there is a strange absence of debates and tools which explore what this means and how this can be facilitated more effectively in people's everyday contexts. With our attention firmly

centred on new knowledge adoption we run the risk of only ever having a partial understanding of how transitions towards more sustainable farming practices and food systems can be initiated and supported. To me this is a glaring gap in agrifood scholarship and much more effort should be placed on finding ways to incorporate social unlearning within AEG more widely.

6.3 The strengths and weaknesses of governing through multiplicity

On a broader level the four papers have drawn a picture of UK AEG that is characterised by constant flux and an ever-growing myriad of AEG instruments and actors, not only since Brexit but certainly even more so due to the institutional void resulting from the UK's withdrawal from the EU's CAP. This leaves the final research question to what extent the transitions that we see on the ground today are indicative for transformational change within the agri-environmental domain of tomorrow? In other words, are the developments around PES, partnership working, communities of practice and digitalisation likely to lead to an ecologisation of agricultural production and to more sustainable food systems, or are we likely to see status quo or even further deterioration and degradation?

As with any big question there are of course no easy answers and the current picture is rather mixed. What is clear though is that the AEG instruments presented and discussed in this thesis are distinctly different from the first generation of AEG instruments that were introduced in the UK in the 1970s-80s. This difference does not lie within *'the voluntaristic ethos which had come to characterize British agri-environment policy'* (Lowe et al., 1997, p. 187). On the contrary this new generation of AEG instruments closely follows this laissez-faire tradition. The distinction also does not lie in the ongoing tensions between instruments of order and acts of disobedience. Just as in earlier anthropological work (Lowe et al., 1997; Scott, 1989, 1985), we can still witness very similar refractory processes of farmer resistance or deviations from governance instruments. For me the difference lies in what Henrik Enroth (2014, p. 70) described as the *'shift from one art of governing to another'* and which goes back to *'the turn from government to governance'* (ibid. p. 61). Whereas earlier governing attempts were directly aimed at producing policy or market interventions for clearly defined target populations (i.e. farmers), the new art of governing is less explicit about whom to govern and more concerned with what to govern, i.e. problem-centred (Enroth, 2014). Within the agri-environmental domain

these problems have become increasingly complex and diffuse (not least due to advances in science and technology as touched upon in this thesis), and they typically transcend the boundaries between various actors, responsibilities, and causal relationships. As such this new generation of AEG instruments is a result and reflection of our own realisation that neither state-led nor market-based interventions will ever be enough to sufficiently address problems as complex as diffuse water pollution or unsustainable levels of meat production and consumption. Thus, what is emerging in the UK is a mishmash of AEG networks which operate between and across the cracks of responsibilities that were either left untouched by state or market actors, or that have developed over time at different scales and levels. It characterises an ongoing search for more bespoke governance functions and approaches which are tailored to specific problems – a process in which universality and standardisation become superseded by differentiation and customisation, and to some degree individualisation. As such it is also a symptom of our time in which such traits and developments are in vogue and with this of course come several advantages and disadvantages.

Among the positive outcomes of the transition towards governing through multiplicity is the room it provides for innovation and creativity, for trial and error, for new actors to take on governance responsibility where it is missing, and for more progressive approaches to emerge that can tackle agri-environmental problems more fundamentally. The PFLA is a case in point here (Chapter 4). This community of practice has made grain-free livestock farming socially acceptable again within the farming sector and it made such produce accessible to consumers by building a bespoke market. In doing so the organisation has punched way above its weight. Not only has it significantly shaped the discourse on regenerative farming in the UK and thereby contributed to the diffusion of more sustainable ways of farming beyond its own member base, but the organisation has also effectively influenced wider policymaking. For instance, the latest proposal of the Welsh Sustainable Farming Scheme now includes various farming practices and techniques that were originally promoted by the PFLA. For example mob grazing and multi species swards are proposed as optional actions within the new scheme which is set to replace Glastir from 2025 (Welsh Government, 2022). Here we see the productive links that can emerge between different instruments within an AEG framework premised on multiplicity.

Such productive links were also evident in the other cases. Be it the plasticity provided by the PES label which allowed its users to align and assemble ecological issues with some of their underlying structural problems (Chapter 2); the combination of digital and non-digital modes of knowing which enabled more informed decision-making (Chapter 5); or the concerted efforts of partner organisations to provide clarity and consistency in farm advice on a regional level (Chapter 3). Thus, in many respects all cases explored in this thesis have challenged the status quo and led to positive agri-environmental changes albeit of course with very different reach, speed, and impact.

Besides these positive outcomes of multiplicity some major weaknesses of this new art of governance have also emerged in this thesis. For instance, the partnership principle mobilised by Farm Herefordshire (Chapter 3) or by the EEP-Ecobank in Pembrokeshire (Chapter 2) bears close resemblance to the *‘techniques and entanglements of governing through community’* as described by Vollebergh, de Koning and Marchesi (2021) in the case of social welfare programmes in Europe. This includes the reliance on affective labour and tendencies to downplay the roles and responsibilities of the state in attempts to avoid any potential negative images and to create the illusion of shared ownership over problems and potential solutions. Interestingly, within UK AEG this tendency of downplaying is not necessarily restricted to government bodies alone, it can also affect other governance actors such as environmental groups who are now also expected to leave their badges at the partnership door. As a consequence, we see the further erosion of boundaries between all governance actors, and this can result in rather *‘opaque accountabilities’* and *‘unwieldy networks’* (Vollebergh et al., 2021), if left uncoordinated and disaggregated.

This leads me to a broader conclusion of this thesis: While governing through multiplicity seems to crystallise as the dominant approach or tactic in UK AEG, it remains unclear if there is (or indeed ever was) a sovereign actor who is able – let alone willing – to provide direction and coherence? At the moment this remains highly questionable, and there seems to be contentedness with the fact that:

‘Governance is everywhere, with the roles of professionals and clients, volunteers and state agents becoming blurred in a messy social field of governance that promises to, effortlessly, govern itself’. (Vollebergh et al., 2021, p. 752)

Thus, the focus on problems, the absence of clear direction, and the occurrence of a self-governing public in UK AEG raise interesting questions for future research. For instance, how interoperable or contradictory is the multitude of AEG instruments and networks? How can voluntary and mandatory AEG instruments complement and strengthen each other? What is necessary to orchestrate much more rapid transformative change within and beyond agricultural production? What does it take for an agri-environmental problem to be put on the governance agenda? Which problems continue to be bypassed despite the possibilities arising through multiplicity? And most importantly, who evades responsibility and accountability when governance is allegedly everywhere? In sum, there is a continuous need for documenting this broader transition in AEG. Based on the findings of this thesis I would argue that a more refined understanding about the prospects and limitations of this new art of governing is needed to help us rethink and redesign what are essentially piecemeal approaches to governing complex social-ecological problems. In order to arrive at more effective AEG, we need to delve into the systemic aspects of governance and for this we must explore and unravel more clearly the interplays, the disconnections and contradictions, and the gaps that exist between different AEG instruments and networks on all levels and scales. More encompassing and comparative approaches to studying multiplicity in AEG should prove useful to ensure that our greater awareness and appreciation of different means being able to achieve diverse ends will also eventually meet wider societal and environmental objectives. Without it we may run the risk of increasing contradictions, duplications, parallelism, and disorientation, and of leaving synergies and positive feedback loops undiscovered and untapped.

6.4 Towards socially informed, power-sensitive, and transformative AEG

In conclusion, the results of this thesis make a very strong case for what Van Hecken and colleagues (2015) have called for in relation to PES, namely analysis that is much better informed socially and also sensitive to questions and relations of power. Based on the insights of this thesis I would argue that such calls apply to all AEG instruments in principle and that this list of analytical demands should be extended by a systemic and transformation-oriented AEG analysis. With this I mean AEG analysis which looks beyond the performativity of individual governance tools and actors, and even beyond single governance networks or assemblages. What is missing are

social scientific enquiries that make much better sense of the benefits and flaws of governing through multiplicity and to provide critical and clear orientations for the multitude of actors involved. This should include continued attention to potentially game-changing developments in governance (and other parts of life), but also consider the gradual changes which are set in motion through the interplays of everyday governance, which in sum and over time can have positive and broad-based effects. Such analysis is important not only for documenting and qualifying potentially heterogenous governance outcomes of multiplicity, but also to better inform its future directions of travel.

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Appendix

1. List of interviews

No.	Interview partners	Location	Date
1	Academic expert	Cardiff	18 March 2016
2	Welsh Government	Cardiff	23 March 2016
3	Academic expert	Cardiff	1 April 2016
4	Farmer	Crai, Powys	18 April 2016
5	eNGO	Talgarth, Powys	20 April 2016
6	Academic expert	Machynlleth, Powys	23 April 2016
7	Farmer	Machynlleth, Powys	23 April 2016
8	Farming association	Hay-on-Wye, Powys	26 April 2016
9	Welsh Government	Aberystwyth, Ceredigion	28 April 2016
10	Academic expert	Narberth, Pembrokeshire	29 April 2016
11	Utilities	Nelson, Caerphilly	3 May 2016
12	Environmental regulator	Carmarthenshire	4 May 2016
13	eNGO	Milford Haven, Pembrokeshire	4 May 2016
14	Environmental regulator	Milford Haven, Pembrokeshire	4 May 2016
15	Academic expert	Cardiff	6 May 2016
16	Academic expert	Cardiff	6 May 2016
17	Farmer	Narberth, Pembrokeshire	14 May 2016
18	eNGO	Narberth, Pembrokeshire	14 May 2016
19	Farm advisor	Pembrokeshire	14-15 May 2016
20	eNGO	Kingsland, Herefordshire	15 Nov 2016
21	Environmental regulator	Clun Hills, Herefordshire	18 Nov 2016
22	Farmer	Herefordshire	25 November 2016
23	Farmer	Herefordshire	2 December 2016
24	Farm advisor	Herefordshire	7 December 2016
25	eNGO	Hereford, Herefordshire	19 Dec 2016
26	eNGO	Talgarth, Powys	21 December 2016
27	Farmer	Herefordshire	17 January 2017
28	Farmer	Herefordshire	18 January 2017
29	Farm advisor	Hereford, Herefordshire	30 January 2017
30	Farmer	Herefordshire	3 February 2017
31	Environmental regulator	Hereford, Herefordshire	15 February 2017
32	Farmer	Herefordshire	23 February 2017
33	Environmental regulator	Worcester, Worcestershire	2 March 2017
34	Farmer	Herefordshire	18 April 2017
35	Farmer	Shropshire	26 April 2017
36	eNGO	Powys	5 May 2017
37	Farmer	Herefordshire	17 May 2017
38	Farmer	Powys	18 May 2017
39	Welsh Government	Cardiff	3 July 2017
40	Welsh Government / Academic expert	Cardiff	3 July 2017
41	Environmental regulator	Hereford, Herefordshire	6 July 2017
42	Farming association	Stroud, Gloucestershire	7 July 2017
43	Farmer	Herefordshire	12 July 2017

2. List of attended events and activities conducted to gather direct observations

No.	Name	Location	Date
1	Ponds, Rivers and Poultry seminar	Llanigon, Powys	29 October 2016
2	WUF farm walk at Caradoc Court	Sellack, Herefordshire	6 November 2016
3	FH Steering Group meeting	Hereford, Herefordshire	7 November 2016
4	Farm advice visits	Various locations in Herefordshire	8 November 2016
5	WUF farm advisor team meeting	Talgarth, Powys	16 November 2016
6	Farm advice visits	Various locations in Herefordshire	21 November 2016
7	Herefordshire Rural Business Advice Day	Hereford, Herefordshire	23 November 2016
8	WUF farm advisor team meeting	Talgarth, Powys	30 November 2016
9	Farm advice visits	Various locations in Herefordshire	2 December 2016
10	Farm advice visits	Various locations in Herefordshire	6 December 2016
11	Wye Catchment Partnership meeting	Leominster, Herefordshire	13 December 2016
12	FH farm walk: Cover crops and conservation seed mixtures	Kings Pyon, Herefordshire	10 January 2017
13	FH Steering group meeting	Hereford, Herefordshire	11 January 2017
14	FH Farm walk: Healthy Livestock from healthy soils, Mahollam Farm	Huntington, Herefordshire	24 January 2017
15	WUF farm advisor team meeting	Talgarth, Powys	25 January 2017
16	Green futures event	Hereford, Herefordshire	31 January 2017
17	WUF farm advisor team meeting	Talgarth, Powys	1 February 2017
18	PFLA farm visit	Ross on Wye, Herefordshire	3 February 2017
19	Farm advice visits	Various locations in Herefordshire	7 February 2017
20	WUF farm advisor team meeting	Talgarth, Powys	22 February 2017
21	FH farm walk: Undersowing Maize	Pembridge, Herefordshire	27 February 2017
22	WUF farm advisor team meeting	Talgarth, Powys	1 March 2017
23	Farm advice visits	Various locations in Herefordshire	6 March 2017
24	Wales Rural Network Funding Fair	Builth Wells, Powys	8 March 2017
25	Herefordshire Meadows Annual Forum	Woolhope, Herefordshire	18 March 2017
26	Wye Catchment Partnership Meeting	Leominster, Herefordshire	24 March 2017
27	FH Steering Group meeting	Hereford, Herefordshire	4 April 2017
28	PFLA farm visit	Chapel Lawn, Shropshire	26 April 2017
29	WUF farm advisor team meeting	Talgarth, Powys	3 May 2017
30	Farm walk with Dr. Christine Jones	Cheltenham	9 May 2017
31	FH Steering Group meeting	Hereford, Herefordshire	19 June 2017
32	Wye Catchment Partnership meeting	Llandrindod Wells	27 June 2017
33	Harmony in food and farming conference, Sustainable Food Trust	Llandovery	10-11 July 2017
34	PFLA farm walk at Bailey Hill Farm	Chalfont St Giles, Buckinghamshire	10 October 2017

Appendix

35	PFLA Annual General Meeting	Hitchin, Hertfordshire	11 October 2017
36	PFLA farm walk at Lannock Manor Farm	Hitchin, Hertfordshire	11 October 2017
37	Exploring Pasture farming in the field: Pros, Cons and policy needs	Cirencester, Gloucestershire	25 October 2017
38	PFLA farm walk at Whittington Lodge	Whittington, Cheltenham, Gloucestershire	25 October 2017
39	Soil health – a living perspective: Optimising soil management for agricultural productivity and ecology	Stourbridge, West Midlands	6 November 2017
40	Rural Business Advice Day – Talking grazing with Rob Havard	Hereford, Herefordshire	22 November 2017
41	Wye Catchment Partnership Meeting	Kington, Herefordshire	8 December 2017

The end.

Thank you for reading!