Transforming freshwater governing: A case study of farmer and regional council change in Hawke's Bay, New Zealand

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Charlotte Josephine Mary Drury

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Abstract

Achieving improved freshwater governing and management is a global challenge, from which New Zealand is not exempt. Agriculture has played, and continues to play, a central role in New Zealand's economy, but is also an activity that impacts freshwater. In this research it is argued that a transition is occurring in New Zealand that necessitates transformational change by both farmers and the entities that govern farmers' freshwater management.

This thesis explores at the micro (individual) level the lived experiences of two groups of regime actors involved in NZ's freshwater governing transition: farmers, and regional councils – the governing entity that has the legislative responsibility to manage the freshwater resources of a region.

The governing of farmers' freshwater management in the Tukituki Catchment of the Hawke's Bay region is the single case studied qualitatively. The research question answered is what is shaping the governing of farmers' freshwater management, and what is shaping the regional council's governing of farmers? The relationship between the two groups was of interest also. Data were primarily obtained through semi-structured interviews with farmers and people associated with the Hawke's Bay Regional Council conducted between August 2016 and October 2017.

Findings of this research suggest that the regional council was not actively governing farmer participants. Farmers were changing their freshwater management practices, but in response to broader societal pressures. Changes made were moderated by farmer networks and localised good farming norms linked with farmer identity. Freshwater was not at the time recognised as a component of good farming norms, nor a farmer's identity. Farmer practices instead illustrated the ongoing dominance of a productivist logic.

The transition for the regional council from an entity that historically had a hands-off approach to governing farmers and engaged with farmers through a productivist logic, to an

entity that had an environmental protection logic and actively governed farmers required organisational transformation. It also necessitated a fundamental renegotiation of the relationship between farmers and the council. The challenges experienced by individuals and the organisation as a whole in adapting to a new formal institution that required transformational change arose from sticking points, institutional logics, ways-of-knowing, people's self-identities and relationships. The depth of change necessary, individually and collectively, of farmers, natural resource management (NRM) governing entities and arguably others, explains why improvements in freshwater have not yet been fully realised. As explained by a farmer participant in this research *it's a hellova big job to do this stuff (F2).*

Acknowledgements

"Well, George, we knocked the bastard off"

When considering writing these acknowledgements, Sir Edmund Hillary's comment to expedition mate George Lowe upon summiting Mt Everest in 1953 sprang to mind. As I imagine happens to many PhD candidates, by this point in my candidature the joy of learning and developing new knowledge has dimmed, and it has become about knocking the bastard off. The quotation has particular resonance in our family as it was my Nana who provided teaching cover for George Lowe at his Hawke's Bay primary school to enable him to join that most famous expedition. The choice of the word "*we*" also seems particularly fitting, as without the incredible support of my husband Cam, and our extended family, I would not have been able to complete this thesis. It is often said that it takes a village to raise a child. I would also argue that it takes a village to produce a PhD thesis – particularly if you have a child!

I would like to first acknowledge those people that have been practically involved in my PhD. The support of my former workplace, the Hawke's Bay Regional Council, has been most helpful. I would like to thank the organization for their financial support for my research, and in particular Iain Maxwell and Nathan Heath for their unwavering belief in my ability to undertake this research. I also wish to acknowledge my supervisors, Dr Janet Reid and Associate Professor Dave Horne of Massey University, as well as Nathan Heath of the regional council, who have unrelentingly encouraged me to learn, to *go back to the literature* and learn more. Your excellent support and guidance, and diverse areas of expertise have been invaluable, and have led to many entertaining conversations along the way! I also wish to acknowledge the contribution of the participants in my research, without whom this would not have been possible. I was blown away by people's willingness to give up their time to speak with me, as well as the very personal nature of the views many of them shared with me. I am incredibly thankful for this.

To my friends and family, thank you. Those friends who have asked how my research was going (or not asked!) fueled my enthusiasm for my work. My extended family have provided moral support, and towards the end of my candidature, childcare which has helped immensely. To my father, a retired farmer, thank you for sharing your knowledge, and answering my questions about different farming terms and activities. To my sister Pip, herself a Doctor of Philosophy, thank you for sharing this PhD journey, and truly understanding the highs and lows that have come along the way. Finally, to my husband Cam, who encouraged me to do this, and has supported me so incredibly, to enable me to reach the summit. Particularly since the birth of our son, he has shouldered a huge load to allow me the time to study. He listened to me at times when I was both brimming with passion and enthusiasm, and when I was frustrated, tired and questioning the point of it all. Throughout it all, he encouraged me to continue, reminded me of my love of learning, and reassured me that I would reach the end.

This PhD was inspired by my late Mum's lifelong passion for knowledge. As a teacher, she spent her days, nights and weekends, endeavoring to create a positive environment in which teenagers could learn, and she dedicated herself to providing all her students with the opportunities that education and learning could offer.

It is to our sons Zander and his recently arrived brother Maximilian, that I dedicate this thesis. I hope that this achievement helps instill in them the same lifelong passion for learning I inherited from my Mum. I also hope that my work will make a positive contribution and in some small way improve the world in which they will grow up.

Table of Contents

List of Figures

List of Tables

Abbreviations

BOI	Board of Inquiry
CHB	Central Hawke's Bay
F	Farmer participant
HBRC	Hawke's Bay Regional Council
LAWF	Land and Water Forum
MLP	Multi-level perspective (in transitions research)
NPSFM	National Policy Statement for Freshwater Management
NRM	Natural resource management
RC	Regional Council participant
RMA	Resource Management Act
RRMP	Regional Resource Management Plan
RWSS	Ruataniwha Water Storage Scheme
WoK	Ways-of-Knowing

Chapter 1. Introduction

1.1 Sustainable freshwater management – a global challenge

Freshwater is essential to New Zealand's economic, environmental, cultural and social well-being, and has been described by the Ministry for the Environment (2013) as New Zealand's greatest natural asset. However, the Parliamentary Commissioner for the Environment (2013) has argued that the protection of those freshwater resources presents New Zealand's biggest environmental challenge. The management of New Zealand's land and freshwater resources was argued by Duncan et al. (2018, p. 2) to have become a "hotly contested political issue". The topic has attracted the attention of successive New Zealand governments and various industries (including agriculture) have made efforts to improve freshwater management, and thus the state of the resource. However, the Ministry for the Environment and Stats New Zealand (2020) reported that native freshwater species and ecosystems remained under threat; water in urban, farming and forestry areas was polluted; and changing water flows and climate change negatively affected New Zealand's freshwater – suggesting that work continues to be needed on freshwater governing and management in New Zealand.

New Zealand is not alone in its struggle to sustain its freshwater resources. The management of water pollution (particularly non-point source pollution that is often generated by farming activities) has increasingly been recognised across the globe (eg. Blackstock, Ingram, Burton, Brown, & Slee, 2010; Collins et al., 2016; Duncan, 2016; Patterson, Smith, & Bellamy, 2014) as a major challenge that threatens the ability of ecosystems to continue to provide the services required to support human wellbeing. The United Nations identified the governance of water in a manner that ensures its sustainable and equitable use as one of the greatest challenges of the twenty-first century (United Nations Environment Programme, 2012). Multiple scholars (e.g. Farla, Markard, Raven, & Coenen, 2012; Holtz, Brugnach, & Pahl-Wostl, 2008; Lachman, 2013; Markard, Raven, & Truffer, 2012; Patterson et al., 2017) have

argued that sustainable water governance, necessary to support the long-term sustainability of industrialized societies, requires transformational change in society across a range of societal subsystems (e.g. agriculture and transportation) and in the way that goods are provided. Van Poeck, Ostman, and Block (2020, p. 298) argue that sustainability transitions are the long-term processes of change that are required to transform the deeply anchored structures, practices and cultures within and across society, and would enable realisation of a more sustainable world without persistent and complex "wicked" socio-ecological problems. New Zealand, it is argued throughout this thesis, was (and still is) in the throes of a transition that is necessary to ensure the long-term sustainability of New Zealand's freshwater resources.

1.2 New approaches to freshwater governing in New Zealand

What has been described by some scholars (e.g. Duncan et al., 2018, p. 2) as "industrial scale" agriculture has been identified as one of the activities that has had, and continues to have, a detrimental impact on the state of New Zealand's freshwater. As a consequence, it was argued by Duncan (2016, p. 1) that the agricultural sector was "squarely in the sight of decision makers" when freshwater reform began in New Zealand in the 2000's. The introduction of the National Policy Statement for Freshwater Management (2011) (NPSFM11) (New Zealand Government, 2011) signalled the need for a substantive change in the way that New Zealand's freshwater resources were managed, which then required a shift in the way that people who were practically involved in freshwater management went about their business. Two key groups involved in freshwater management in New Zealand have been regional councils - the local government entity that has the legislative responsibility for managing freshwater at the catchment scale; and farmers, who, given the predominantly rural nature of New Zealand's landscape, manage the majority of New Zealand's land.

The linkage established in the NPSFM11 between land use and freshwater heralded the beginning of greater land use control in New Zealand. Historically, and particularly since the neoliberal reforms of the 1980s, New Zealand government has had limited intervention in how farming operates. The NPSFM11 clearly identified New Zealand's regional councils/unitary authorities[1] as being responsible for ensuring that the NPSFM11 was fully implemented. Recognition of the need to address the impact of diffuse pollution, and thereby mitigate its impact on freshwater quality, led regional councils to introduce rules into regional plans that placed restrictions on how farmers could use their land, particularly with regard to nutrient losses resulting from their land use. This was a new space for regional councils to be working in, and therefore required changes to be made to how they (regional councils) operated - both internally and externally. Despite more than a decade of seemingly never-ending reforms to water related policy and management it was argued by the Ministry for the Environment and Stats New Zealand (2020) in their 2020 Freshwater Summary that freshwater problems persisted in New Zealand.

Although research has explored the nature of farmer change in 'new' governing contexts, little research has explored the nature of change that farmers and governing entities experience as a result of a transition in governing. Changes in the dynamics of the relationship between farmers and governing entities have also received limited attention in the literature. The persistence of this knowledge gap arguably makes governance transitions difficult to achieve.

[1] Six of New Zealand's territorial authorities (district and city councils) also have the powers of a regional council, and are referred to as unitary authorities. They are: Auckland Council, Nelson City Council, Gisborne, Marlborough and Tasman District Councils and the Chatham Islands Council (Department of Internal Affairs, 2011).

1.3 Research Aim and Research Question

This thesis explores at the micro (individual) level the day-to-day experiences of two regime actors (farmers and people associated with the Hawke's Bay Regional Council) experiencing a sustainability transition "in-the-making" (Kohler et al., 2019, p. 18) that has implications for farmers and agriculture, as well as the way that freshwater is governed.

Having worked for the Hawke's Bay Regional Council for over a decade, the researcher had the privilege of working with a range of extremely talented and very passionate people. They were pragmatic and practical people who genuinely wanted to help the community and work to protect the environment. However, they were working within an institutional and legislative environment that influenced how they went about their business, and also how they responded to change. The researcher personally observed regional council staff expressing views that farmers would change their freshwater management practices when new regional council regulations came into effect. This assumption challenged the researcher's own experiences and observations of farmer change processes, which she had observed to be multi-faceted and complex. Limited academic literature had explored this in a New Zealand context which made it difficult for the assumptions of council staff to be constructively challenged. The aim of this research is to contribute empirical knowledge to the agricultural policy field about what is shaping the governing of farmers and their freshwater management practices. This research contributes empirical knowledge to the field about what is shaping the governing of farmers' freshwater management that could inform the development of more nuanced, and hopefully effective, approaches to the governing of farmers and their practices that impact on freshwater in New Zealand. The primary question that this research answers is:

What is shaping the governing of farmers, and the impact of their practices on freshwater, in a farming catchment in rural New Zealand?

The primary research question has three sub-components to it. These are 1) what is shaping the governing of farmers, and their management of freshwater; 2) what is shaping the regional council's governing of farmers; and 3) what is the nature of the relationship between the two groups. This research explores the lived experiences of farmers and a governing NRM entity experiencing a sustainability transition that has implications for farmers and agriculture, as well as the way that freshwater is governed. Freshwater is a new area of governing for regional councils that requires a fundamental renegotiation of the relationship between farmers and the governing entity. Freshwater management is not central to farmers' identity, nor explicit in the practices or symbolic capital associated with that identity and farming norms. Transformational change in the way that both groups engage in freshwater governing and management is therefore necessary.

Change impacted the actions of both groups: the Hawke's Bay Regional Council was grappling with the changes demanded of the organisation's approach to freshwater governing by the community as well as central government. Farmers' participation in freshwater management practices was changing, shaped primarily by productivist drivers, rather than the active governing of the Hawke's Bay Regional Council. Multiple changes, at both individual and organisational levels, were illustrated as being required of the regional council before it would be able to start actively governing farmers. A change from freshwater management and engagement with farmers framed by a productivist philosophy, to engagement framed by an environmental protection philosophy was illustrated as being needed. Illustration of the existence of what are framed in this case as being two fundamentally different institutional logics within an NRM governing entity is another contribution of this research, as is the illustration of a need for change within such an organisation. The change in approach required of the way that the regional council governed freshwater and farmers also necessitated a fundamental renegotiation of the relationship between farmers and the regional council.

Transformational change was illustrated as being needed in how both farmers and the regional council engaged in freshwater governing and management. However, this was complicated by each participant's experience of change differing as a result of being shaped by their unique combination of logics, identities, norms, ways-of-knowing and relationships.

1.4 Research Scope

The researcher adopted an actor-centric approach and focused on the lived experiences of two groups of regime level actors who were experiencing a transition towards sustainability that was occurring, and continues to occur, in New Zealand. Those individuals were farmers, and staff of the Hawke's Bay Regional Council – the local governing entity with the responsibility for freshwater governing in the location of this single case study. This case provides an empirical exploration of the day-to-day experiences of change of individuals whose actions were shaping and directing a sustainability transition that had implications for farmers and agriculture, as well as the way that freshwater was governed. Research that focuses on individuals' experiences of change contributes to the agricultural policy literature given the central role that people play in realising, or not, sustainability transitions. The research also had a relational focus, reflecting approaches taken by other researchers such as Darnhofer, Lamine, Strauss, and Navarrete (2016) who argued that a relational approach aligned well with a systemic worldview (as held by the researcher) that regarded nothing as being static as a consequence of relationships constantly being made and remade. Farmers' relationships with each other, relationships amongst regional council staff, and relationships between the two groups were therefore also matters of particular focus in this research.

This research focused primarily on water quality aspects of freshwater, rather than the full range of activities related to freshwater governing and management. This decision was made primarily to help constrain the scope of this research but also because of the unique challenges that water quality presents, as a consequence of some water quality effects not

being visually apparent, which Duncan (2016) argued challenged farmers' (in Canterbury, New Zealand) ways-of-knowing that drew on direct observation, recollections of the past, their interactions with the soil and landscape, and intuition.

Somewhat unexpectedly, what emerged from the data was evidence of multiple factors shaping (primarily constraining) change within the regional council. Theory was drawn on to inform the exploration of the impact of those factors. Some of the concepts (those of path dependency, lock-in and sticking points) were drawn from the sustainability transitions and NRM literature. However, the concepts of institutional logics and ways-of-knowing draw from other academic fields of study. This research contributes to several bodies of literature including sustainability transitions, NRM governing, and institutional logics.

1.5 Positioning the researcher

All research reflects the worldview and experiences of the researcher. It is therefore important to outline the key influences on this researcher so that the discussion and conclusions reached can be contextualised and interpreted appropriately.

The researcher grew up on a sheep farm in West Otago, close to the regional boundary separating the Otago and Southland regions, in the south of New Zealand's South Island. She was the third generation to live at 'View Farm' which was a 167 hectare drystock property on moderate to rolling hill country. The area had been predominantly a sheep and beef farming area. However, a large number of flatter properties were converted to dairy farms during the 1990s. The eldest of two daughters, the researcher was actively involved on the farm – in part because of the property not being large enough to sustain the employment of additional staff. The researcher's mother was a secondary school teacher at the local high school and was engaged in off-farm employment almost all of the time the researcher's parents lived on the property. Born in the early 1980's, not long after the researcher's father had succeeded his father as the owner of the property and considerable investment had

been made in construction of a new woolshed and covered yards, the researcher grew up through a time of great change and challenge in New Zealand's agricultural sector.

Upon completion of an undergraduate degree in physical geography, and a Masters in Regional and Resource Planning at Otago University, the researcher gained employment at the Hawke's Bay Regional Council, with whom she worked for twelve years. During that time she worked in the policy, regulatory and land management teams of the organisation, and in her last few years at the council was directly involved with work being undertaken to implement the Tukituki Plan. In late 2017, the researcher left the regional council to establish her own planning consultancy.

The researcher commenced this research in 2014 – driven by a desire to address the apparent gap in the empirical academic literature about what is shaping the governing of farmers, and the impacts of their practices on freshwater. As noted above, the researcher identified this area of literature as lacking empirical work based in a New Zealand context, after she became aware of regional council staff operating under the assumption that farmers would simply change their freshwater management practices when new regional council regulations came into effect. This assumption challenged the researcher's own experiences and observations of farmer change processes and fuelled a desire to undertake empirical research that enabled that view to be replaced by an evidence-based understanding of farmers' responses to governing.

A resilience framing was initially explored for this research – in part because the term resilience was widely used by the Hawke's Bay Regional Council across a range of contexts[2], and the researcher had a desire to understand what the theoretical concept of resilience encompassed, and whether the term was being used appropriately. Although argued by

[2] A case in point is the vision of the Hawke's Bay Regional Council which sought a "connected and vibrant region with resilient communities, a prosperous economy, and a clean and healthy environment" (Hawke's Bay Regional Council, 2015a, p. 3).

Darnhofer et al. (2016) to capture the dynamics of ongoing change, and focus on understanding social and ecological drivers of change, as the data gathered for this doctoral research were analysed and interrogated, it became apparent that a fundamental transformation in how freshwater was governed and managed was occurring both in New Zealand, and globally, and an alternative theoretical framing, namely the sustainability transitions literature would be useful in helping to explore and understand the implications of that.

1.6 Thesis Overview

This Introductory Chapter is followed by an exploration of the literature that has been drawn on to inform this research. In Chapter Two, given the contextual setting of this research was one of change, sustainability transitions literature is explored, as well as literature that has explored farmer behaviour change and change within natural resource management agencies[3] – the two regime actors on whose experiences of change this research has focused. To help make visible what was shaping the change evident in the results (particularly change within the Hawke's Bay Regional Council) the theoretical concepts of path dependency, lock-in and sticking points; institutional logics and ways-of-knowing were all drawn on, and relevant literature from these fields is discussed. Chapter Three focuses on the case description and provides relevant background and context about the specific case that has been studied – that being the governing of farmers, and the impact of their practices on freshwater, in the farming catchment of the Tukituki River, in southern Hawke's Bay. The research design is outlined in Chapter Four. The results that emerged from the 24 semi-structured interviews undertaken are explored in Chapter Five, which is concluded by a summary of the institutional logics that were evident in the way that farmers and regional

[3] As is discussed in the next chapter, natural resource management agencies have been considered to be a governing entity that fulfill similar functions to regional councils which are peculiar to New Zealand.

council participants engaged in freshwater management, as well as the sticking points that appeared to be constraining the process of change for the regional council. The Discussion Chapter (Chapter Six) explores the implications of these findings. Chapter Seven concludes this thesis by clearly articulating the conclusions that can be drawn from this research, and identifying future research and policy implications that have emerged.

Throughout this thesis where verbatim data quotes are used they are indicated by the use of italics. The coding that has been used to identify the participant is *F* for a farmer participant and *RC* for a regional council participant.

Chapter 2. Literature Review

2.1 Introduction

The transitional context in which this research was undertaken meant that it was relevant to ground the research within the sustainability transitions literature. There is an extensive literature on sustainability transitions. In this chapter the key fields/domains are focused on in order to structure and justify the choice of approaches. This is explored first in Section 2.2. Literature that has focused on how the two regime actors that are the focus of this research (farmers and the NRM governing entity of the regional council) have changed is explored next (Sections 2.3 and 2.4). The role of farmer identity, good farming norms and trust are explored in the farmer focused sections of this chapter (Sections 2.3.1 to 2.3.3). Literature that has examined change within natural resource management agencies is then explored (Section 2.4). What emerged from the data was evidence of multiple factors shaping change within the regional council. To help make visible these factors, several theoretical concepts were drawn on. Some of the concepts (those of path dependency, lock-in and sticking points) were drawn from the sustainability transitions and NRM literature. However, the concepts of institutional logics and ways-of-knowing draw from other academic fields of study. This research makes a contribution to a number of literatures including sustainability transitions, NRM governing, and institutional logics.

2.2 Sustainability transitions

As indicated above, this research was undertaken at a time when a sustainability transition was argued to be occurring in New Zealand. Sustainability transitions were argued by Markard et al. (2012) to involve long-term, multi-dimensional and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes of production and consumption. Loorbach, Frantzeskaki, and Avellino (2017) contended that large-scale societal changes must be made by the human race to solve

the challenges that society now faces. The magnitude of change required by all sectors of society is one of the defining themes of the sustainability transitions literature. It was argued by Kohler et al. (2019), who recently reviewed and presented an updated research agenda for the Sustainability Transitions Research Network[4], that the central aim of transitions research was to conceptualise and explain how radical change can occur in the way societal functions are fulfilled. One of the most widely reported examples of a sustainability transition is the energy transition - the need for society to move away from fossil fuels towards more renewable sources of energy (e.g. Goggins, Fahy, & Jensen, 2019; Heiskanen, Apajalahti, Matschoss, & Lovio, 2018). Climate change, environmental degradation and natural resource limitations are other problems facing society that seemingly require a sustainability transition to enable them to be addressed (Werbeloff, Brown, & Loorbach, 2016).

2.2.1 What is a sustainability transition?

The term sustainability transition lacks a widely agreed definition. However, there are a number of characteristics of a transition that are generally accepted as being distinguishing features (Chang et al., 2017; Grin, Rotmans, Schot, Geels, & Loorbach, 2010; Loorbach et al., 2017; Zolfagharian, Walrave, Raven, & Romme, 2019). Those characteristics are that transitions are:

- Co-evolutionary: Transitions involve radical changes across multiple domains/dimensions, that interact with each other and change over time.
- Multi-actor: Transition processes are enacted by a range of actors and social groups, therefore they can involve many kinds of agency (for example learning, conflict and power struggles).

[4] The Sustainability Transitions Research Network is explained in further detail in Section 2.2.2.

- Multi-level: Transitions occur at multiple levels (namely niche, regime and landscape levels), and change at each level is influenced by change at the other levels.
- Long-term: Although periods of radical change, such as the adoption of new technologies, can be relatively short-lived (e.g. 10 years), societal transitions are long-term processes that evolve over multiple decades.
- Non-linear: Transitions are characterised by disruptive, shock-wise change, rather than constant, stepwise change.
- Emergent: New, stable orders (or regimes) emerge from processes of chaotic change, and the outcome cannot be foreseen or planned in advance.
- Characterised by variation and selection: Transitions involve the development of a variety of new innovations, and their selection by society.

Markard et al. (2012) and Werbeloff et al. (2016) argued that the difficulty in addressing sustainability challenges was that they were often coupled with (and aggravated by) strong path dependencies and lock-ins of existing sectors, and a variety of elements that can include established products, technologies, user practices, lifestyles, complementary technologies, business models, regulations, and institutional structures that are tightly interrelated and dependent on each other.

The terms *transition* and *transformation* are used seemingly interchangeably in the literature; however, Holscher, Wittmayer, and Loorbach (2018) argued that they are distinct concepts that offer complementary insights that aid understanding of desirable, societal changes. Holscher et al. (2018) contended that the term *transition* referred to changes in social sub-systems (for example energy or agriculture), rather than large scale societal change processes, and transition studies focused on understanding how change had occurred (in part by focusing on what forces supported or hindered a transition), rather than what change occurred, and what the impact of that was (as they contended was the focus of transformation studies). Given the focus of this research is at the individual level, on

exploring people's experiences and what has shaped their behaviour in relation to freshwater – arguably how change had (or hadn't) occurred, the term *transition*, as explained by Holscher et al. (2018), is favoured in this research). Arguably a transformation is not evident until a change process, or transitional period, has ended and the magnitude of change that has occurred becomes apparent. The term transition describes change that is occurring, and given this study is of a contemporary transition that remains in progress the term transition more accurately describes the ongoing process of change that has been the focus of this research.

2.2.2 History of field of sustainability transitions

Increasing awareness of the raft of large-scale challenges that society now faces has led to a rapid growth of interest in the field of sustainability transitions in the last ten years (Kohler et al., 2019). In fact, de Haan and Rotmans (2011) argued that only in recent years have societal transitions become a field of study in their own right. In their review of the "state of the art", Kohler et al. (2019, p. 1) identified the establishment of the Sustainability Transitions Research Network in 2009 as a turning point in the field, and argued that since its establishment, research in the field has developed rapidly. That development has been reflected in terms of amount of material published; geographical spread, expanding beyond (predominantly Northern) Europe where the concept initially gained popularity, to Australia, Asia, Africa and the Americas; and facets of the field being researched – having moved beyond energy and transport transitions for which the framework of sustainability transitions was originally utilised. More components of transitions theory are also now being explored, such as the influence of power and politics on transitions (Kohler et al., 2019).

Research in the sustainability transitions field has primarily focused on what Kohler et al. (2019, p. 2) referred to as the "meso-level" or middle level of a system – changes within societal sub-systems. Kohler et al. (2019, p. 2) argued that this is a unique characteristic of

the field because the broader field of sustainability studies had predominantly focused on the "macro" level of society, considering very broadscale societal changes, such as changing the nature of capitalism; or at the "micro" level, where matters such as individual choice, attitudes and motivations provided the focus for studies. This doctoral research is predominantly focused on exploration of a sustainability transition at the micro level, as individual choice, attitudes and motivations of both farmers and regional council participants are of particular interest. This marks a contribution of this research to a less explored area of the sustainability transitions literature.

2.2.3 Theoretical aspects of sustainability transitions

There is variation amongst the views of transitions scholars about frameworks or approaches to studying transitions. For example, Lachman (2013, p. 270) identified the multi-level perspective, strategic niche management, transition management, innovation systems, techno-economic paradigm and socio-metabolic transitions as being the "more notable" transitions approaches. Kohler et al. (2019) named the multi-level perspective, technological innovation systems, strategic niche management and transition management as the key theoretical frameworks, as did Markard et al. (2012) and Zolfagharian et al. (2019). This doctoral research has adopted a more human-centred approach that has sought to understand the lived experience of individuals embedded in a contemporary transition, which is arguably not particularly well suited to any of these approaches, due to their high level of structuration. Although a focus at the micro-level is not unique (e.g. Vainio, Varho, Tapio, Pulkka, & Paloniemi, 2019; D. White et al., 2019), it is not yet a widely practiced approach, particularly in studies that explore contemporary transitions, and marks another contribution that this research makes to the transitions literature.

As in any field of academic study, there are concepts and terminology unique to that field. One of the main analytical frameworks in the field, the multi-level perspective (MLP), utilises

three hierarchical levels of structuration that guide system analysis – namely the niche, regime and landscape levels (Wittmayer, Avelino, van Steenbergen, & Loorbach, 2017). The multi-level perspective is premised on the concept that transitions occur as a result of dynamic processes within and between three analytical levels, namely 1) niches, which are small, protected spaces in which radical innovations occur; 2) regimes, which are the dominant, stable configurations of existing societal systems; and 3) landscapes, which are the wider, exogenous context (Kohler et al., 2019). Grin et al. (2010) described the relationship between the three levels as being a nested hierarchy, with regimes being embedded within landscapes and niches within regimes. The general thrust of the MLP is that radical innovations/alternatives to the existing regime emerge within niches (Kohler et al., 2019). These can break through into the existing regime creating system change if broader societal change occurs at the landscape level that puts pressure on the existing regime. Loorbach et al. (2017) argued that the concept of the regime was the most central notion of transition studies, being the dominant and stable configuration in a societal system, and transitions did or did not occur as a consequence of change occurring at the level of the regime. Interactions between all levels, but particularly the niche and regime, occur in multiple dimensions, such as society, markets, regulations, and technologies; and are enacted by actors that navigate through transitions by fighting, negotiating, learning and building coalitions (Kohler et al., 2019).

Another type of structuration used within the transitions literature is the multi-phase concept which divides a successful transition process into four distinct phases, namely a pre-development, take-off, acceleration[5] and stabilization phase (Chang et al., 2017; Grin et al., 2010; Loorbach et al., 2017). It was argued by Grin et al. (2010) that if the ideal result of system stabilization is not achieved, there are three alternative pathways for the system: 1)

[5] Some scholars also refer to this phase as the breakthrough phase (e.g. Chang et al., 2017).

a system becomes locked-in to existing development paths; 2) there can be a system backlash, which results in an innovation path being blocked; or 3) complete system breakdown, that ultimately results in a system collapsing and eventually dying. Transition processes are contended by Grin et al. (2010) to take at least one generation, which they defined as 25 years; and feature periods of fast and slow developments.

While useful to inform understandings of why and how transitions have occurred, both the multi-level perspective and multi-phase concept have been criticised (e.g. Chang et al., 2017; Wittmayer et al., 2017) for their lack of attention to the role of people within transitions. This doctoral research contributes to the sustainability transitions literature by providing an empirical case study that has explored the lived experience of regime actors involved in a contemporary transition.

A number of perspectives have also been used to explore transitions. Loorbach et al. (2017) argued that this was a strength of the field because it allowed for fundamental differences in ideas about the role of research and how it should be approached; while still enabling debates across disciplines and approaches through the use of shared language and concepts of transitions. Loorbach et al. (2017, p. 609) contended that there are three "dominant and prominent" approaches to studying transitions that stem from differing epistemological and disciplinary backgrounds: a socio-technical approach; a socio-ecological approach; and a socio-institutional approach.

A socio-technical approach, Loorbach et al. (2017) argued, originated from the field of science and technology studies, and until recently was the most commonly utilised approach. Studies following this approach often focused on regimes that had emerged around dominant technologies. Systems such as energy, mobility and water have been studied following a socio-technical approach because that facilitated the analysis of the role of infrastructure and technologies in these systems (Loorbach et al., 2017). The multi-level

perspective has been used to analyse systems in a socio-technical manner. Socio-ecological approaches have their roots in ecology and resilience theory that examines coupled socio-ecological systems. This approach has been used to explore issues such as biodiversity and nature, ecosystem services and climate resilience, and draws on concepts such as ecological thresholds, panarchy and planetary boundaries in providing explanations about change (Loorbach et al., 2017).

The third approach that was outlined by Loorbach et al. (2017), a socio-institutional approach, draws from the social sciences and seeks to understand systemic changes in complex societal systems by focusing on the identification of institutionalised cultures, structures and practices, and conceptualises these as being the regimes in which transitional change takes place. Understanding how institutional dynamics, incumbent routines, powers, interests, discourses and regulations create path dependencies and how these are challenged by social innovations is the focus of a socio-institutional approach. A socio-institutional approach focuses on the role of agency and governance in transitions, and generally adopts a reflexive stance. A socio-institutional approach was reflected in this doctoral research because of its focus on agency and governing.

2.2.4 Empirical application of a sustainability transitions approach

To date, empirical transitions research has been heavily focused on Europe, particularly the Netherlands (Beers, van Mierlo, & Hoes, 2016; Hassink, Grin, & Hulsink, 2018; Loorbach, 2010). The Dutch Government was one of the first states to formally acknowledge the sustainability transitions field by embedding it in the country's National Environmental Policy Plan in 2001 (Loorbach et al., 2017). They identified four transitions in particular as being necessary: transitions to sustainable energy; sustainable use of biodiversity and natural resources; sustainable agriculture; and sustainable mobility. Twenty million euros of government money were committed over six years to fund transitions research which

stimulated the development of transitions research. While transitions research has expanded well beyond the Netherlands, it does still have a strong European focus and has primarily been undertaken in developed country contexts (Chang et al., 2017; Lachman, 2013).

Empirical research in the sustainability transitions field has to date predominantly been focused on exploring transitions in four areas or sectors of society: the energy sector (e.g. Goggins et al., 2019; Heiskanen et al., 2018; Lindberg, Markard, & Andersen, 2019); the agriculture/agri-food sector (Gosnell, Gill, & Voyer, 2019; Roberts & Geels, 2019; Schaffer, Eksvard, & Bjorklund, 2019); the water sector (Pahl-Wostl, Becker, Knieper, & Sendzimir, 2013; Werbeloff, Brown, & Cocklin, 2017; Werbeloff & Brown, 2016); and the transport/mobility sector (Roberts & Geels, 2019; Stalmokaite & Yliskyla-Peuralahti, 2019). Some of these studies have also explored a particular component of a transition process, such as governance (Goggins et al., 2019; Werbeloff & Brown, 2016), or the shaping influence of power and politics (Roberts & Geels, 2019).

New Zealand transitions research

Empirical research that has used sustainability transitions theory to frame research in the New Zealand context has increased in recent years but remains limited in its depth and breadth.

Several studies have used the multi-level perspective to explore components of both the energy and transport transitions in New Zealand. Ford et al. (2017) examined the influence of a range of factors on the uptake of residential solar photovoltaic (PV) systems in New Zealand; and Hopkins (2017) explored changing trends in the mobility of young adults in New Zealand, in the hope that gaining understanding of mobility trends amongst young adults

might provide some insights into how a societal transition to a post-automobility[6] regime could be achieved in New Zealand. Berka, MacArthur, and Gonnelli (2020) explored the role of community/ grassroots energy initiatives in New Zealand's energy transition and observed that they had achieved relatively limited success due to the absence of an enabling institutional context and the entrenchment of incumbent interests. Zahraie, Everett, Walton, and Kirkwood (2016) explored the role of environmental entrepreneurs (niche actors) in the greening of New Zealand's wine industry.

Duncan et al. (2018) also drew on the sustainability transitions literature, together with social practice theory, in their work that sought to ground the concept of transformation in the lived experience of people involved with the management of land and water in New Zealand. They explored practice-based encounters of transformations to make visible the often unseen internal and experiential dimensions of transformations. In addition to findings that supported existing research that had identified catalysts for change, barriers to change, and power relations shaping transformations Duncan et al. (2018) argued that precursors of change such as linked hearts and minds, values, and processes of change, such as finding shared values, testing and experimenting, were important in facilitating the first steps of transformation and were often missing from accounts of transformations.

2.2.5 Criticism of a transitions approach

The overly mechanistic and deterministic nature of the commonly used MLP is an area of sustainability transitions research that has drawn criticism (e.g. Fuenfschilling & Truffer, 2014) and has been argued to have the potential to "crowd out" the influence and role of human agency and politics in shaping transitions (Hinrichs, 2014, p. 149). The need for a greater focus on the influence of power, politics and governance in transitions has also been

[6] A post-automobility regime is explained by Hopkins (2017) to be a regime that is not focused on the automobile and its associated systems.

highlighted by a number of scholars (e.g. de Gooyert, Rouwette, van Kranenburg, Freeman, & van Breen, 2016; El Bilali, 2019; Geels, 2011; Hinrichs, 2014; Lachman, 2013; Markard et al., 2012), as has the need for additional attention to be paid to the role of agency[7] (Fuenfschilling & Truffer, 2016; Heiskanen et al., 2018; e.g. Lachman, 2013; Shove & Walker, 2007).

The spatiality/geography of transitions is another area in which further transitions research has been identified as being needed, particularly in developing countries. In highlighting this issue, Lachman (2013) emphasised the highly contextualised nature of transitions research and noted that theory related to transitions in other settings (ie. developed countries) needed to be thoroughly analysed, tested and adjusted before being applied in developing country settings.

2.2.6 A sustainability transitions response to the research question

The sustainability transitions literature, if the popular multi-level perspective was applied, would suggest that what was shaping the governing of farmers, and the impact of their practices on freshwater, was the dynamics of interactions between the niche, regime and landscape levels of the system studied. Farmers arguably operate at both the niche and regime level and may innovate with different practices that have a reduced impact on freshwater. The regional council is part of the governing regime; and the landscape level includes the broader community/society including those that have a particular interest in freshwater. Based on the literature, a change in farmers' practices that have an impact on freshwater may occur if farmers have the opportunity to develop alternative farming practices, and those practices are able to break into/are recognised by the existing regime - which could occur if broader societal change at the landscape level simultaneously put

[7] The definition of 'agency' suggested by Grin, Rotmans, and Schot (2011) is followed in this research, which explains agency as the making of independent choices by actors.

pressure on the existing governing regime. Arguably a link exists with processes related to the change of good farming norms, and there are some theoretical similarities between a regime and norm, in that processes of change take time. Unless change occurs at the level of the regime the literature (e.g. Loorbach et al., 2017) would suggest that change in farmers' practices should not be expected to occur.

2.3 Farmer behaviour change

As the research question sought to explore what shapes the governing of farmers, and the impact of their practices on freshwater, this research needed to be informed by an understanding of the existing literature regarding farmers' experiences of change. This is a relatively well served area of academic endeavour, seemingly fuelled, at least in part, by a desire to understand the reasons behind the failure of agri-environmental schemes in the UK and Europe to bring about change in on-farm practices that were required to achieve the European Union's Common Agricultural Policy (CAP) (Burton, Kuczera, & Schwarz, 2008). The academic literature about farmer behaviour related to water quality suggests that understanding and influencing this behaviour is a complex and multi-faceted challenge, interwoven with issues of power and politics within farmer cultures, between peer groups, and the wider policy and political settings (Blackstock, Ingram, Burton, Brown, & Slee, 2010; Mills et al., 2017). Recognition of the complexity of farmer behaviour change, and that farmers do not exist in a social vacuum is relatively new. Scholars such as Blackstock et al. (2010) have argued that farmers are shaped by ideas and practices negotiated by the social groups in which they are embedded, which has led to calls for more research that explores the influence of social and cultural issues as well as geographical contexts on farmers' decisions. This doctoral research contributes to that area of literature by providing a single case study that has focused on individuals' lived experiences of change, in a rural catchment in New Zealand.

Farmer behaviour change has multiple facets. Those that are relevant to this doctoral research are farmer identity, good farming norms, and the influence of trust on farmer relationships.

2.3.1 The shaping role of farmer identity

According to McGuire, Morton, Arbuckle, and Cast (2015) the concept of farmer identity was initially identified by Burton (2004) in an effort to better understand why British grain farmers were not adopting voluntary environmental improvement efforts. Burton (2004) argued that farmers' role identities were closely linked to their personal identities, and further advanced the idea of farmer identity by creating typologies of farmers (Burton & Wilson, 2006). The basic premise of identity theory, as argued by Burton and Wilson (2006), was that the self reflected society, and as society comprised multiple social groups and was structured and hierarchical; it followed that the self, which arose from social experience, was constructed from multiple identities that were structured and hierarchical. Burton and Wilson (2006) argued that of an individual's multiple identities, their occupational, gender, family, ethnic and national identities were particularly important, and of those, occupational and gender identities were often prioritised in an individual's hierarchy of identities. Further, Burton and Wilson (2006) contended that levels of attachment to a group determined how committed an individual was to maintaining a particular identity, and therefore how important that identity was in an individual's decision-making process. In return for commitment to a group, an individual could expect to receive, through both social affirmation and self-assessment, the security offered by a sense of group belonging, and a sense of self-esteem, both of which provided substantial motivation for future compliance with group norms. The social or relational nature of identity, the need for individuals to confirm/verify their identities, and use of social situations to evaluate and receive feedback have also been argued by other scholars (e.g. Fielding, Terry, Masser, & Hogg, 2008; Sulemana & James, 2014).

If the basis of an individual's self-conception was a particular social identity (e.g. a farmer), Fielding et al. (2008) argued that an individual's behaviour could be expected to become group-based and guided by the norms of that social group. Further, Fielding et al. (2008) contended that the process of categorising oneself in terms of a particular social identity resulted from the accentuation of similarities between the self and other in-group members, and differences between the self and out-group members, i.e. how similar one is to other farmers, and how different farmers are to other groups such as urban dwellers. Fielding et al. (2008) had undertaken research with farmers in Australia that explored their engagement in sustainable agricultural practices, and found that behaviours such as agricultural practices could be centrally linked to a social identity (e.g. rural landholder), and the norms of that group would influence behaviour rather than the expectations and desires of generalised others.

Communities of practice are a concept that are considered important for the construction of norms, as well as the sharing of knowledge (Dolinska & d'Aquino, 2016). Ulbrich and Pahl-Wostl (2019) argued that communities of practice are groups of individuals with shared interests and problems related to a specific topic whose mutual interactions and knowledge exchange enable community members to deepen their expertise (in their respective field) over time. Ulbrich and Pahl-Wostl (2019) also contended that communities of practice support the creation of shared meaning and collective identity, and can facilitate social learning processes and shape social practice (i.e. norms). Conceptualised as informal learning spaces, Dolinska and d'Aquino (2016) argued that communities of practice enable the collective production and reproduction of discourse, and therefore have a role in shaping farmers identity.

A relatively extensive literature base has sought to distinguish among different types and identities of farmers. These have been found to be varied, complex, overlapping, and not always separated by clear-cut boundaries (Sulemana & James, 2014). Burton and Wilson

(2006, p. 110) were amongst the first to argue, based on their British study, that all farmers (to varying degrees) based their self-conceptions around primary production-based roles and perceived themselves "first and foremost" as someone that produced food (and to a lesser extent fibre) with the aim of maximizing food production and passing on an economically viable farm business to the next generation. Burton and Wilson (2006) contended that such entrenched productivist self-concepts of farmers existed in the United Kingdom, Europe, and advanced economies as a whole, and even in some economically less developed countries. The importance of farmers' productivist identities has been widely argued in the literature (Burton, 2004; Burton et al., 2008; Burton & Paragahawewa, 2011; Burton & Wilson, 2006; Cullen et al., 2020; Saunders, 2016). While production remains a critical component of farmers identities, recent years have seen an increase in the popularity of the concept of multifunctional agriculture, which G. Wilson (2007) argued recognised the production of other values beyond food and fibre such as cultural landscapes and heritage, biodiversity, recreational opportunities, rural settlements and food security. The concept of multifunctional agriculture recognises the multiple positive contributions that farming activities can make to economies, environmental management and the viability of rural communities, and arguably broadens the measures used to assess a farmer's ability beyond their food and fibre production. For example, based on empirical research with New Zealand dairy farmers, Maysek, Dominati, White, and Mackay (2017) argued that planted riparian margins had multiple benefits. They improved water quality, increased biodiversity, provided cultural ecosystem services, benefited on-farm management and could also increase on-farm productivity, and thereby contributed to a multifunctional landscape. The importance of a strong stewardship ethic amongst farmers has also been recognised by scholars such as Greiner and Gregg (2011) as shaping farmers land management behaviour.

Some scholars (e.g. McGuire, Morton, & Cast, 2013; Sulemana & James, 2014) have explored the tension between the conservationist and productivist identities of farmers. It was

contended by Sulemana and James (2014, p. 59) that "if there is a problem regarding the environmental management practices of farmers, then it occurs when farmers see themselves as "businessmen" and adopt a productivist orientation". Based on empirical work undertaken with Iowa cropping farmers that lived within one catchment[8] McGuire et al. (2013) argued that being branded as "polluters" triggered a chain reaction that (eventually) activated farmers' conservationist identities and resulted in modifications of the locally accepted rules and norms of good farming to change farming practices that impacted on water quality (McGuire et al., 2013, p. 64).

The importance of a business identity of farmers has been recognised by a number of scholars, and argued by Hunt, Rosin, Campbell, and Fairweather (2013) to be present in the New Zealand context. Informed by the results of empirical work with New Zealand sheep/beef farmers, dairy farmers and kiwifruit orchardists, Hunt et al. (2013, p. 1) argued that the neoliberal reforms of the 1980s had required farmers to diversify and become entrepreneurial to sustain economically viable farming operations, and consequently recognition of farmers as business people had become "culturally acceptable" and incorporated into the habitus of New Zealand farmers. Knook and Turner (2020) explored how effective agri-environmental participatory research and extension programmes were in achieving change in farmers' practices in New Zealand and Scotland. They used an institutional logic framing, and identified a business logic, orientated towards running a profitable farm; a lifestyle and/or a learning logic guided farmers' behaviour. Knook and Turner (2020, p. 417) argued that external pressure for environmental change had led farmers to expand their interpretation of a profitable farm to include one that was "ticking the boxes" from a compliance perspective as well. They observed that New Zealand farmers were under more pressure from the public to improve practice than Scottish farmers, and

[8] The term 'watershed' is used in the study and is commonly used in America to describe what are referred to in New Zealand as 'catchments'.

therefore it was more important in the New Zealand context that environmental "boxes" were ticked to the extent that satisfied the public (Knook & Turner, 2020, p. 418). McGuire et al. (2015, p. 146), based on work undertaken with American farmers (in the state of Iowa), also observed that increasing societal expectations of farmers had created a social situation that made it challenging for some farmers to verify their farmers' identity as doing "good" for the environment, and thus societal expectations had shaped farmers' practices.

The generation of typologies[9] of farmers has been a commonly used approach to examine the role of farmers' self-identity (e.g. Greiner & Gregg, 2011; McGuire et al., 2015; Sulemana & James, 2014). Studies have primarily been conducted in the United States, the European Union and Australia (McGuire et al., 2015).

Answer to research question based on farmer identity literature

The farmer identity literature would suggest that what is shaping the governing of farmers, and the impact of their practices on freshwater, was the need for farmers to regularly verify their identities as good farmers. Societal calls for a reduction in the impact of farming on freshwater required farmers to activate their conservationist identities (and prioritise that identity either alongside or above their productivist identity) and change their farming practices (and eventually modify local good farming norms) to reduce their impact on water quality. Assuming that society recognised that farmers had changed their practices, and they received positive feedback about this, farmers would be able to verify their identities as good farmers.

2.3.2 The shaping influence of good farming norms

Intertwined with the concept of farmer identity is a rich and well-established system within the farming community that links the display of skilled farming behaviours, a farmer's

[9] Some typologies used are based on farmers' perception about themselves, and others are based on actual farming practices (Sulemana & James, 2014).

position with the community, and their self-identity as a 'good farmer'. The idea was initially conceptualised by Rob Burton (Burton, 2004), and subsequently adopted and further developed by other scholars (Riley, 2016; Shortall, Sutherland, Ruston, & Kaler, 2018; Sutherland & Burton, 2011; Thomas, Riley, & Spees, 2019). The concept of good farming was based on the premise that farmers' management practices were shaped by localised good farming norms, and farmers attached symbolic meaning to the choices they made and the behaviours they exhibited. The physical appearance of a farmer's crops and/or stock were argued by Burton (2004) to make visible a farmer's skills that other farmers could assess by looking across boundary fences. Other farmers used that information to inform their assessment of the skills and social status of the farmer whose property they had viewed. Good farming norms have been observed to change over time (de Krom, 2017; Sutherland et al., 2012) and there can be localised differences in what constitutes a good farmer (Huttunen & Peltomaa, 2016). What has been consistently argued across the literature is that good farming norms have a strong shaping influence on farmer behaviour.

It was argued by Burton (2004) that since World War Two, a desire to develop a secure food supply for the United Kingdom, and support rural communities had been the primary focus of development within the agricultural sector – bringing to the fore the importance of farmers achieving high levels of production. Knook and Turner (2020, p. 415) argued that because of the strong relationship between New Zealand and the United Kingdom up until the 1970s[10] the main objective of New Zealand agriculture had also been to help feed the UK – driving, in their view, a "strong productivist mentality amongst farmers". For many years the agricultural sector has followed a productivist model that emphasised, and rewarded, achievement of optimum yields through the use of intensive farming methods. The ongoing importance of productivity is arguably reinforced by the visual system of appraisal that

[10] Knook and Turner (2020) argued that the nature of the UK-NZ relationship changed in the 1970s as a consequence of the UK joining the European Union in 1973.

Burton and Wilson (2006) argued had become embedded in the farming cultures of most developed western agricultural economies. In acknowledging the shaping influence of the established system of farmer appraisal, Burton (2004) contended that policy-makers must show greater sensitivity to the magnitude of the change that participation in agri-environmental schemes required of farmers. Participation in such schemes, Burton (2004) argued, required farmers to revisit their self-perceptions, their systems of status transfer, and the meanings of individual farming acts, and could risk potential loss of their status as a good farmer. Participation in schemes did not simply involve structural changes (i.e. practice changes), but also changes in the social fabric of the community.

An ongoing need to visibly demonstrate their good farming skills has been argued to continue to shape farmer behaviour. Burton and Paragahawewa (2011) argued that adoption of any farming practice that was not illustrative of local good farming norms could damage a farmer's reputation, and therefore compensation may be necessary for the social losses that farmers experienced as a result of changing farming practices, and moving towards more post-productivist or multifunctional roles. Recent empirical work undertaken by Thomas et al. (2019) also observed that maintaining an ability to visibly demonstrate their skills as good farmers, in a manner consistent with local good farming norms, remained an important determinant of farmer behaviour.

To date most 'good farmer' research has been terra-centric which initially seems counterintuitive given the increasing global focus on the management of water and riparian environments through regulations such as the EU Nitrates and Water Frameworks (Thomas et al., 2019). However, when the centrality of land in the construction of a farmer's identity is considered in light of Burton's concept of the good farmer, the ongoing terra-centricity of the field is not altogether surprising. The (relatively) static nature of land means that a farmer can effectively display their good farming skills on it. Based on empirical work undertaken with English farmers, Thomas et al. (2019, p. 111) argued that the ability for

farmers to demonstrate their good farming skills was challenged by the "(im)materiality, unpredictability and untidiness" of riparian environments. The fluidity of such environments made it difficult to display good farming skills, which potentially constrained the inclusion of farming practices that benefited freshwater into good farming norms. A reduced reliance on the visual observation of other farmers' skills and provision of assistance to farmers to learn and understand how other, less production focused symbols could demonstrate good farming skills was contended by Thomas et al. (2019) to potentially enable farmer practice change that did not align with current good farming norms.

Good farming norms have been observed to change over time. Sutherland and Darnhofer (2012, p. 232) studied organic and conventional farmers in two locations in England at a time when the "rules of the game" were changing. They argued that they had observed a broadening of the good farming ideal and the concept was not a static notion but open to reconfiguration. Huttunen and Peltomaa (2016) also explored whether or not good farming ideals changed over time. Their research was undertaken in Finland and explored changes in farming practice as a consequence of participation in agri-environmental schemes. Their findings highlighted the highly contextual nature of good farming ideals and they argued that while good farming ideals could act as a cultural barrier to the adoption of new farming practices, they could also actively contribute to the accommodation and development of new practices.

Farmers' decisions about practice change have been illustrated to be multi-dimensional (e.g. Bewsell, Monaghan, & Kaine, 2007; Inman et al., 2018; Knook et al., 2020; Mills et al., 2017), as was also evident in this research. Positive effects on freshwater could be one driver of change but did not drive change in and of itself. Based on their examination of factors influencing New Zealand dairy farmers decisions to adopt stream fencing Bewsell et al. (2007) argued that if a farmer did not perceive there to be on-farm benefits likely to result from the adoption of a particular practice, they were unlikely to adopt it. In addition to the

need for multiple drivers of change, Thomas et al. (2019) argued that farmer decision making was rarely a simple dichotomy of production vs environmental perspectives, but rather reflected place-specific and potentially habitat-specific (i.e. land compared with riparian) dispositions that shaped how farmers managed those environments – further complicating the challenge of unpacking drivers of on-farm practice change.

Good farming norms shape farmers practices impacting freshwater

The good farmer literature would suggest that what is shaping the governing of farmers, and the impact of their practices on freshwater, was place and habitat specific good farming norms. Such norms can evolve over time, but evolution does take time. The visual appearance of new farming practices influences whether there may be delays in them being adopted and those that reflected productivist values were likely to be adopted more quickly.

2.3.3 Trust, relationships and farmer behaviour

Farmers' relationships have an important role in shaping their behaviour. The level of trust a farmer has in another influences the dynamics of their relationship and how a farmer treats any advice shared by that person.

Trust, being one's expectation of how another party will act in a particular context, was argued by Fisher (2013) to have two separate but equally important components. One component was personal/relational trust, which related to an individual advisor and was particularly influenced by an advisor's practical experience (compared with say their academic knowledge), and a farmer's perception of whether an advisor understood and respected their farming goals. The second component identified by Fisher (2013) was institutional trust, and related to the level of trust a farmer had in the institution/organisation that an advisor represented, or was perceived to represent.

Given that the relationship between farmers and the regional council was a matter of particular interest in this doctoral research, it was considered relevant to provide some

commentary on literature that has explored trust between farmers and NRM governing bodies[11]. Some scholars (e.g. Sharp & Curtis, 2014; Sutherland et al., 2013) have argued that advisors that are considered to be an extension of government are unlikely to earn high levels of trust. Based on empirical work undertaken in the United Kingdom, Hall and Pretty (2008) argued that low levels of trust in government delayed farmers' uptake of sustainable land management practices that had been recommended by government staff. Sutherland et al. (2013) argued that organisations that seek to deliver a combination of advice and regulation, as arguably New Zealand's regional councils do or will, can find the development of trust particularly challenging because the link to regulation can create a barrier for farmers in their development of trust. Another potential challenge for the development of organisational trust was highlighted by Sharp and Curtis (2014) who explored irrigating farmers' trust in the New South Wales Office of Water, Australia. They argued that trust was a multi-level phenomenon, therefore it was important that organisations did not just focus on improving inter-personal relations between farmers and advisors, but also worked to demonstrate their competency, integrity and benevolence at the organisational level, within the place-based communities they sought to govern. They argued that trust in individual staff did not always lead to trust in the broader organisation, which could result in farmers not trusting messages delivered by staff about required changes in land management practices.

While there is general agreement across the farmer behaviour literature that trust in an advisor influences a farmer's treatment of information they receive, some scholars such as Fisher (2013) have identified other processes that can influence whether or not the provision of advice results in on-farm practice change. Based on empirical research undertaken with

[11] Bodies that govern farmers activities that have an impact on freshwater vary from country to country, but include both central and local government organisations, as well as natural resource management organisations.

English cattle farmers, Fisher (2013) argued that the provision of information and development of usable knowledge were two distinct processes. Information that is provided to farmers must be first understood, and secondly, a farmer must have confidence in that information, and trust in the advisor that delivered it, before that information can be transformed into usable knowledge that a farmer may accept and act upon (Fisher, 2013). Fisher (2013) also highlighted the influence that the dynamics of a farmer's relationship with a particular advisor could have on a transformation process, and observed that longevity, consistency and regularity of contact facilitated the development of trusting relationships between farmers and their advisors. Thomas et al. (2019) argued that extended periods of engagement, an advisor's own farming biography, and an advisor's ability to demonstrate contextual knowledge (relating to both the locality and a particular farm) assisted the establishment of trusting relationships with farmers.

Answer to research question based on trust literature

The trust literature would suggest that the level of trust a farmer has in their relationship with another shapes the way that farmers treat information and advice they receive from that person. If a farmer has a high level of trust in an individual, they are likely to take their advice on board, and that may support them to make changes to their farming practices that impact on freshwater. The multi-faceted nature of trust means that farmers' trust, or distrust, in the organisation of the regional council, could shape the way they treated messages about behaviour change shared by the organisation.

In the next sections of this chapter, literature related to change within natural resource management agencies is explored (Section 2.4). An NRM agency is the other regime actor that this doctoral research is focused on, and therefore an exploration of relevant literature is necessary to enable the results of this research to be contextualised.

2.4 Change in natural resource management agencies

Although the concept of local government (compared with central government) is well established across the globe, New Zealand's regional councils are unique in the array of functions that they are responsible for fulfilling, which are not restricted to functions under the Resource Management Act (RMA) (1991), but also include roles under other pieces of central government legislation such as the Local Government Act (2002) and the Land Transport Management Act (2003). Notwithstanding that, at the time of writing, the primary focus of New Zealand's regional councils was the fulfillment of their responsibilities under the RMA that sought to promote the integrated and sustainable management of natural and physical resources within a region. As a consequence of regional councils being an organisation unique to New Zealand, there is limited literature available about change processes within them, therefore there was a need to draw on other literature to frame this work. Lockwood, Davidson, Curtis, Stratford, and Griffith (2010) argued that natural resource management (NRM) was a term often used to describe activities associated with the management of forestry, agriculture and water allocation. It was further contended by Lockwood et al. (2010) that NRM embraced catchment and landscape-scale management strategies and engaged with biodiversity conservation, control of pest plant and animals, and the maintenance of soil and water quality. The definition offered by Lockwood and Davidson (2010) described with surprising accuracy the functions of the Hawke's Bay Regional Council as set out in the Resource Management Act (1991)[12], therefore it was considered that, for the purposes of this doctoral research, the regional council could be considered to be a natural resource management organisation, and literature in that area could be drawn on.

[12] Section 30 of the Resource Management Act sets out the functions of a regional council as essentially being control of the use of land, the coastal marine area, and freshwater for the purposes of soil conservation, water quality and quantity, and the avoidance or mitigation of natural hazards; as well as managing indigenous biodiversity ("Resource Management Act," 1991).

It was argued by Kirsop-Taylor, Hejnowicz, and Scott (2020) that empirical work that has examined change within natural resource management agencies was limited and surprising given the increased pressure created by political and economic challenges and public expectations that many contemporary NRM organisations struggled to negotiate. There remains a gap in knowledge about how governing entities transition, and how individuals working within those entities experience such transitions. The case study within this doctoral research makes a contribution to that area of literature. The work of Kirsop-Taylor et al. (2020) focused on organisational culture within Natural Resources Wales, the Welsh national natural resource management agency that, at the time their research was undertaken, was experiencing a transition. Kirsop-Taylor et al. (2020) argued that organisational and operational complexities (such as human resources, strategic development issues and executive accountabilities) needed to be addressed before the complexities of policy implementation and evaluation could be tackled; and that the development and use of particular narratives could assist in achieving cultural change across an organisation - cultural change that was necessary to enable the successful functioning of a public NRM organisation. Kirsop-Taylor et al. (2020) contended that the challenges that NRM organisations faced were particularly complicated because of the complex, inter-related social-ecological systems that they sought to govern – systems that were facing both local and global sustainability challenges.

In light of the current limitations on literature related to change within NRM organisations, it was considered appropriate to look to other areas to provide some grounding and context to this particular component of the research. Literature about environmental governance, and more specifically water governance was considered to be relevant given the governing focus of the research question and is explored below in Sections 2.4.1 and 2.4.2.

2.4.1 The field of environmental governance

Research that has explored the governing of farmers and the impact of their practices on freshwater sits within the broader field of environmental governance. Environmental governance is an expansive, relatively new area of literature that Armitage, de Loe, and Plummer (2012) argued has emerged as a consequence, at least in part, of the failure of conventional command and control approaches to resource management. The occurrence (or not) of a purported transition from government to governance in environmental management is a matter that has attracted substantial attention and comment in the literature. Speaking in relation to environmental governance pertaining specifically to conservation practice, Armitage et al. (2012, p. 245) argued that "governments are no longer the most important source of decision making in the environmental field" and that governance should no longer be considered to be something that governments do, but a broad responsibility to be shared amongst all interested stakeholders. van der Molen, van der Windt, and Swart (2016) contended that environmental governance occurred in a variety of political arenas beyond the governmental institutions of the nation-state, and had emerged as the result of new and different dynamics relating to knowledge being recognised as needing to be taken into account in policy making. Lockwood and Davidson (2010) developed governance principles for regional NRM organisations in Australia in an effort to increase the capacity of those organisations to deal with the complex problems of NRM. They (Lockwood & Davidson, 2010, p. 987) contended that the study of environmental governance was concerned with "the interactions among structure, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how citizens and other stakeholders have their say".

While there is not a universally accepted definition of environmental governance, most definitions recognise as a key characteristic that the exercise and practice of governance must enable the views of a range of actors (i.e. both state/government and non-state/non-

government) to be taken into account in decisions related to the management of the environment. Five components of environmental governance suggested by Armitage et al. (2012) provide some clarity about what the defining attributes of environmental governance (from a normative perspective) may include. They are: 1) a need to recognise the importance of fit and scale; 2) a need to foster adaptiveness, flexibility and learning; 3) a need to coproduce knowledge from diverse sources; 4) a need to understand the emergence of new actors and their roles in governance; and 5) changing expectations about accountability and legitimacy.

While more explicitly articulated in some discussions about environmental governance than others, a broadening of views about what types of knowledge should be incorporated into environmental governing decisions appeared to characterise the proposed transition from government to governance. Informed by their study of the governing of recreational boating in the Dutch Wadden Sea area, van der Molen et al. (2016) argued that the central role of scientific knowledge in decision-making was questioned and views about what constituted valuable and useful knowledge broadened significantly. A range of explanations have been offered as to why scientific information has held such a central role in decision-making, which was evident in this doctoral research case also. Brugnach (2017) argued that science was perceived by many to be neutral and unbiased, although it has increasingly been recognised that science is not independent of emotion, and emotions shape the attitudes and judgements of all human actors, that then affect their cognitive representations of the world (Brugnach, 2017). Smallman (2020, p. 589) argued, based on interviews with British central government science policymakers, that an image of "science to the rescue" had developed, and science was looked to as the problem-solver in policy making processes – in part because it was perceived to provide a "correct" and "sound" basis for decision making (Smallman, 2020, p. 596). It was argued by Kirk, Reeves, and Blackstock (2007), based on their exploration of the role of the Scottish Environment Protection Agency in the implementation

of the regulation of the Water Framework Directive (2000), that path dependency within NRM organisations, and their historic focus on physical sciences, meant that at least initially, solutions to environmental problems based in the physical sciences were likely to be favoured over other approaches such as social science with which such organisations had limited experience. Arguably in New Zealand, physical science continues to be privileged by the legal resource management framework, as illustrated by the dominance of physical science indicators specified in the NPSFM20 that must be met (New Zealand Government, 2020). In any event, the ongoing centrality of scientific knowledge has increasingly been questioned, and calls for, and processes to enable other types of knowledge, such as experiential or indigenous knowledge, to be included in environmental decision making have been a feature of discussions about the proposed transition from environmental government to governance.

The empirical literature classifies governance both according to type, for example integrative or transformative governance (Crona & Bodin, 2010; Loorbach et al., 2017); as well as topic, for example water governance (Bischoff-Mattson & Lynch, 2017; Edelenbos & van Meerkerk, 2015; Hassenforder & Barone, 2019; Pahl-Wostl, Holtz, Kastens, & Knieper, 2010).

2.4.2 Water governance

A number of scholars (e.g. Potts, 2020; Waylen, Blackstock, & Holstead, 2015) have argued that historically command-and-control approaches, characterised by top-down, technocratic decision making that used fixed, static regulations to try and achieve change have been used to manage freshwater. Floress, Akamani, Halvorsen, Kozich, and Davenport (2015), amongst others, have argued that such approaches have failed to effectively manage freshwater resources which has resulted in a move to freshwater increasingly being managed using more collaborative approaches. These collaborative approaches, it was argued by Floress et al. (2015) in an American context, reflected changes at the landscape level that occurred as a result of the public expressing a growing interest in environmental issues and desire to be

more actively involved in addressing them. Floress et al. (2015) argued that this demonstrated increasing recognition of the need to better integrate and provide for the human dimension and the diversity of views that it brings to freshwater management. Opening up freshwater management to include more diverse groups of participants Waylen et al. (2015) argued has been advocated because it is expected to contribute to the development of more informed, effective and equitable management outcomes. However, endeavours to implement such outcomes, at least in the British context in which the research of Waylen et al. (2015) was undertaken, have achieved variable outcomes.

While more inclusive and adaptive ways of managing freshwater have started to be adopted more regularly (Cradock-Henry, Greenhalgh, Brown, & Sinner, 2017; Fliervoet, Geerling, Mostert, & Smits, 2016; Sinner, Brown, & Newton, 2016), it has been argued by some scholars such as Brugnach (2017) that models and modes of knowledge production that genuinely took into account the knowledge and values of a range of groups of society remained "in the making" (Brugnach, 2017, p. 35), and the desire for a single knowledge, and thus a single solution, persisted. The research of Duncan (2016) with farmers and the regional council in Canterbury, New Zealand, observed this. In that case the council had determined a sustainable nutrient load limit based on monthly water quality samples and average flow records at one location within the subject catchment that they deemed representative of the river and the land use practices of all farms across the catchment. This approach (which is commonly adopted by regional councils across New Zealand) Duncan (2016) argued effectively rendered the bio-physical and social-cultural landscape irrelevant, and assumed an ontological singularity, that conflicted with farmers' ways-of-knowing that were based on both place and time specific understandings of the relationship between land and water. Acknowledgement of a multiplicity (of knowledges) was argued by Duncan (2016) in that case to be absent but urgently needed to allow farmers and the regional council to work together, while continuing to practice their divergent ways-of-knowing.

A number of scholars (e.g. Bennett & Satterfield, 2018; Lockwood, 2010; Pahl-Wostl, 2017) have argued that there is a material difference between water governance and management, and that distinction is accepted and applied in this doctoral research. The various definitions offered define water management as the resources, plans and actions that result from the functioning of governance; the activities actively involved in managing water, such as analysing and monitoring water resources; and the development and implementation of measures that keep water within desirable bounds (Bennett & Satterfield, 2018; Lockwood, 2010; Pahl-Wostl, 2017). In contrast, the concept of water governance has been argued (e.g. Bennett & Satterfield, 2018; Lockwood, 2010; Pahl-Wostl, 2017) to encompass the social functions that regulate the development, management and provision of water resources; and the powers, authorities and responsibilities exercised by organisations and individuals over water, with effective governance argued to be a prerequisite for effective management. The term water governance Pahl-Wostl et al. (2020) contended captured the complexity of processes that provides the context within which water management occurs. The differentiation argued to exist is of interest, because in some literature the terms governance and management were used interchangeably, yet other literature would argue they mean materially different things. A consistent definition and usage across, and in some cases even within literature, was not evident.

One of the leading scholars in the field of water governance, and particularly transitions towards sustainable water governance, is Claudia Pahl-Wostl whose research has primarily focused on water governance in a European context, and included both normative and empirical work (Pahl-Wostl, 2017, 2019; Pahl-Wostl et al., 2010; Pahl-Wostl, Jeffrey, Isendahl, & Brugnach, 2011; Pahl-Wostl et al., 2020). Recently Pahl-Wostl et al. (2020) argued that coordination problems continued to plague efforts to implement more integrated approaches to sustainable water governance and management – in part a result of the complexity of water resource challenges and the need for the co-ordination of multi-

level governance across different levels and sectors. Pahl-Wostl et al. (2020) contended that integrated water resources management (IWRM) has been an attempt to integrate water with other policy objectives. Despite what the name suggests, the concept of integrated water resources management has been concerned with the integration of both water governance and management. The popularity of integrated water resource management approaches has been highlighted by other scholars (e.g. Edelenbos & van Meerkerk, 2015; Gerlak & Mukhtarov, 2015) and attributed to the complex and interconnected nature of water, and need to involve multiple, in many cases fragmented institutions and processes in its governance and management.

Pahl-Wostl et al. (2020) observed that while many countries have integrated resource management principles into their laws and policies, on-ground implementation has continued to be slow and impedes sustainable water governance and management. In an effort to help address such issues of co-ordination, Pahl-Wostl et al. (2020) developed a conceptual framework that they contended could be used to help identify and address coordination issues in multi-level water governance systems. They argued that its use across a range of cases could help develop cumulative knowledge that supported transformative change in water governance and management. In other normative work Pahl-Wostl (2019) explored the role of different modes of water governance (such as bureaucratic hierarchies, networks and markets), and argued that meta-governance was needed to overcome the complexity of water governance. Pahl-Wostl (2019) defined meta-governance as the governance of governance – a reflexive process of societal learning that enabled the development, evaluation and adaption of governance approaches seeking to address complex societal challenge.

Much of the empirical integrated water resource management work has been set in a European context, where the challenge of river catchments crossing national borders has presented an additional challenge to integrated water governance and management (Pahl-

Wostl, 2007). In an Australasian context, the social-ecologically and institutionally complex Murray-Darling Basin in Australia has been the focus of empirical work (Bischoff-Mattson & Lynch, 2017; Papas, 2018). In her review of the development of the field over the past decade, Pahl-Wostl (2017) argued that an improved understanding of how to achieve the governance of transformation, and the transformation of governance, was needed to support transformative change towards sustainable governance and management of water. The ongoing dominance of an integrated water resource management has been challenged by some scholars such as Gerlak and Mukhtarov (2015) who argued that the water security discourse has grown in recent years. They used a normative ways-of-knowing approach to explore the conflict and synergies between the two discourses (integrated water resource management and water security) and argued that both concepts should be used to inform water governance as both ways-of-knowing emphasised different perspectives. An integrated water resource management way-of-knowing was a scientifically informed and prescriptive way-of-knowing, and a water security way-of-knowing a discursive approach that highlighted the human dimension of water management. Gerlak and Mukhtarov (2015) argued in support of the incorporation of both ways-of-knowing in water policy development because it would increase the range of policy options that could be considered.

2.4.3 Response to research question based on governance literature

The governance literature would suggest that what was governing farmers, and the impact of their practices on freshwater, was governance entities that had, or were in the process of, adapting their ways of working to adopt more collaborative approaches to water governance. These changes, the literature suggests, moved natural resource management approaches away from technocratic, top-down approaches that used fixed regulations to try and achieve change, and were processes that had at their centre governments that relied primarily on scientific information to inform their management decisions about freshwater. Evidence of change of this nature was absent in this doctoral research case. In an effort to

make visible why such change was not illustrated in this case, other areas of literature were drawn on, which are explored in the final sections of this chapter (Sections 2.5.1 to 2.5.3).

2.5 Enablers and constraints of change

The case explored in this doctoral research illustrated a regional council that was not actively governing farmers. This finding was not anticipated. As set out in the Chapter Three, active governing of farmers' actions that impacted freshwater was not something the Hawke's Bay Regional Council had historically undertaken, therefore becoming active in this space required change of the regional council, and farmers, and the relationship between the two groups. The findings of this doctoral research illustrated that the required change had not occurred within the council. In seeking explanations for these results the researcher drew on a number of theoretical concepts that make visible enablers and constraints of change. The use of several concepts reflects the range of literature with which this research has encouraged engagement, and also the researcher's desire to contribute to the agricultural/natural resource management policy literature through a singular in-depth case study that focused on the experience of individuals embedded in a transition "in-the-making" (Kohler et al., 2019, p. 18). The concept of legacy effects is drawn from the sustainability transitions and NRM literature that have already been explored in this chapter. The concepts of institutional logics and ways-of-knowing are drawn from other areas of literature and are theoretical concepts that enable the exploration of what shapes individuals' worldviews and thus their behaviour.

2.5.1 Legacy effects – Lock-in, path dependency and sticking points

The legacy of particularly the regional council, but also farmers, appeared to shape how both groups negotiated change. The sustainability transitions literature recognises that the legacy of an organisation, institution or individual can constrain change in a sustainability transition and the concepts of lock-in, path dependency and sticking points have been utilised to

explore the impact of those legacy effects (Grin et al., 2010; Waylen et al., 2015). The three related concepts effectively represent a continuum of legacy effects. Waylen et al. (2015) argued that lock-in was the most extreme form of path dependency in which new arrangements were entirely determined by past systems or ways of working. The theory of path dependency, argued Kirk et al. (2007), suggested that when choices had to be made about how a system would be managed, the option most likely to be chosen was that which most closely resembled existing practice or previous choices. The identification of sticking points, Waylen et al. (2015) argued, could help explain resistance to change, but it did not prohibit or prescribe particular outcomes of change. Pahl-Wostl (2017) argued that the highly interconnected nature of the structural conditions in water governance and management systems, such as existing infrastructure, regulations, professional practices and decision-making processes; and the interdependence and mutual reinforcement of various system elements continued to stabilize the previously dominant command and control paradigm, making it particularly challenging to move away from.

The best insights to the applicability of legacy effect were argued by Waylen et al. (2015) to come from the water management literature, although they did note that such studies were limited. The interest in the exploration of legacy effects within that field, Waylen et al. (2015) contended, arose from a desire to understand why so many of the attempts to transition water management towards less technocratic approaches had encountered difficulties. The project level focus of the empirical work of Waylen et al. (2015) meant that their focus had been on exploring sticking points in the implementation of management approaches (rather than governance approaches).

As noted above, it was contended by Waylen et al. (2015) that lock-in was the most extreme form of path dependency in which new arrangements were entirely determined by past systems or ways of working. Lock-in strongly constrained change as it meant that a system was effectively unable to be moved/diverted from an existing development path (Waylen et

al., 2015). Backlash or system breakdown were alternative outcomes, but are arguably less common, or at least less well explored in the literature.

The theory of path dependency, argued Kirk et al. (2007), suggested that when choices had to be made about how a new regulatory approach could be implemented, the option most likely to be chosen was that which most closely resembled existing practice or previous choices. Kirk et al. (2007) argued that this was because the adoption of new approaches required first the acquisition of information about alternative approaches, and then possibly also investment in training or the purchase of new equipment (what have been termed switching costs). As noted above, Kirk et al. (2007) explored the Scottish Environmental Protection Agency's implementation of the Water Framework Directive 2000 (particularly regulation of diffuse pollution) and observed path dependency which they attributed to resource constraints that narrowed the range of options considered for implementing regulation. They contended that this magnified the impact of the institutional history of the organisation and the influence of the disciplinary commitments of the staff on the implementation process.

Another means of exploring the impact of legacy effects on the evolution of transitions is through the identification of sticking points. The concept of sticking points was contended by Waylen et al. (2015) to be helpful because it could moderate expectations about how quickly change could be achieved, particularly where multiple sticking points were identified and must be overcome. Waylen et al. (2015) argued that sticking points differed from the concepts of path dependency and lock-in because they did not prohibit or prescribe particular outcomes of change. In this doctoral research the researcher was also drawn to the concept of sticking points because it seemed to frame constraints to change in a way that maintained an organisation's or individual's potential to overcome those constraints. In contrast the concepts of lock-in and path dependency seemed to pre-determine the outcome of a change process.

Waylen et al. (2015) contended that sticking points can be of an institutional, cognitive or political nature. Institutional sticking points arose from previous ways of working; cognitive sticking points from previous ways of framing and knowing; and political sticking points from pre-existing power relations. Sticking points, Waylen et al. (2015) argued, could constrain an organisation's ability to open up and move away from previous approaches because incumbent interests and problem framing could produce strong resistance to change. Despite calls for sticking points to be given more explicit attention in both research and practice (e.g. Waylen et al., 2015), the concept remains relatively underutilized and reasons for that are unclear. Consequently, few examples of the concept's application in empirical research could be found. Diercks (2019) utilised the concept in his exploration of the Organisation for Economic Cooperation and Development policy mixes selected to promote sustainability transitions, and identified a number of sticking points (of institutional, cognitive and political natures) that had impeded the institutionalization of system innovation in the core activities of the organisation. Leach, Scoones, and Stirling (2010) utilised the seemingly similar concept of *pressures* (rather than sticking points) to explore governance responses to epidemics and emerging infectious diseases. Their work highlighted how cognitive, institutional and political pressures shaped the narratives that different actors used to frame systems that promoted particular goals, values and pathways of disease response. Leach et al. (2010) argued that this marginalised pathways of disease response that involved long-term structural, land use and environmental change, or accommodated local knowledge and livelihood goals; and instead favoured stability.

The empirical work of Waylen et al. (2015) reviewed sixteen environmental management projects across the British Isles that had sought to implement the ecosystem approach[13].

[13] The ecosystem approach is explained by (Waylen et al., 2015) to be a concept that entails participatory holistic management, and was adopted by the Convention on Biological Diversity to achieve "the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way" (Waylen et al., 2015, p. 1).

Their review highlighted a legacy of project delivery that did not focus on holistic or participatory approaches, and identified sticking points of a cognitive, institutional, and political nature that appeared to constrain the capacity of organisations to change. For example, funding criteria and duration was identified as an institutional sticking point because established funding cycles created timing constraints and in some cases were too short, particularly for projects that needed to establish participatory processes that tended to evolve slowly and unpredictably over time. A tendency to focus on single issues was also identified as a cognitive sticking point Waylen et al. (2015). The continuation of practices such as monitoring single biochemical indicators of water quality was argued to constrain the development of systemic understanding.

Summary of legacy effects response to research question

The legacy effects literature would suggest that what was shaping the governing of farmers, and the actions of the regional council, was the legacy of both groups. The literature would suggest that previous ways of working, framing/knowing and also pre-existing power relations had an important shaping influence.

2.5.2 Institutional logics

The concept of institutional logics offers an opportunity to explore more deeply the rarely articulated, yet foundational assumptions, values and beliefs that individuals hold and through which they engage with change. The identification of institutional logics enables the underpinning philosophical ideas that shape individual and organisational relationships; negotiation of meaning; and legitimation of practices to be made visible (Osei-Amponsah et al., 2018).

The concept of institutional logics recognises the central role that institutions play in processes of change. Ostrom (2005), one of the first and arguably most prominent scholars to recognise the importance of institutions in the governing and management of natural

resources, defined institutions as "the prescriptions that humans use to organize all forms of repetitive and structured interactions including those within families, neighborhoods, markets, firms, sports leagues, churches, private associations, and governments of all scales" (Ostrom, 2005, p. 3). Institutions can be of a formal (i.e. written rules) or informal nature and have been argued by scholars such as Kooijman, Hekkert, van Meer, Moors, and Schellekens (2017) to mediate human interactions with natural resources, but are generally relatively resistant to change and tend to be maintained and reproduced across generations. Other scholars have described institutions as providing the "rules of the game" (Osei-Amponsah, van Paassen, & Klerkx, 2018, p. 14; Yeboah-Assiamah, Muller, & Domfeh, 2017). However, scholars such as Bosomworth (2018, p. 416) have attributed the definition of "rules of the game" to the specific area of institutional theory focused on institutional logics.

Fuenfschilling and Truffer (2014, p. 774) explained institutional logics as being the "deep structural rules that coordinate and guide actor's perceptions and actions" or the coherent arrangements of beliefs, norms, values and practices that stem from dominant societal institutions. Such definitions have a strong structural focus and concentrate on analysing the content and coherence of structures in the socio-technical system of interest. This doctoral research adopted an alternative definition of institutional logics that focused more on the role of logics in providing meaning to people's daily activities, defining institutional logics as "the socially constructed, historical patterns of cultural symbols and material practices, including assumption, values, and beliefs, by which individuals and organisations provide meaning to their daily activity, organize time and space, and reproduce their lives and experiences" (Brodnik, Brown, & Cocklin, 2017, p. 2301). A number of other scholars (e.g. Osei-Amponsah et al., 2018; Smink, Negro, Niesten, & Hekkert, 2015; Turner et al., 2017) have adopted the same definition. This definition was considered to be better suited to this current research because of its focus on the lived experiences of individuals, and also better highlighted the synergies of the concept with the socially constructed nature of the concepts

of both farmer identity and good farming norms that are also utilised in this research. Bosomworth (2018, p. 418) contended that because institutional logics were socially constructed, they were "path-*shaping*" rather than "path-*determining*" [italics in original], and thus could be renegotiated over time. Arguably this idea has some alignment with the concept of sticking points which Waylen et al. (2015) argued helped identify change constraints, but did not prohibit or prescribe particular outcomes of change.

Institutional logics were argued by Bosomworth (2018) to be important in shaping change because they influenced an actor's view of the feasibility, legitimacy, possibility and desirability of solutions to a problem (in addition to the problem definition itself). Institutional logics therefore shape the boundaries within which new ideas and concepts must function, what questions are asked and what and whose knowledge is considered and prioritised. Although not the method adopted in this doctoral research, one of the methods that can be used to identify institutional logics is discourse analysis. Brodnik et al. (2017) argued that words and vocabularies are indicators of institutional logics because language is a tool that actors use to construct their reality and matters that are talked about a lot can indicate areas of conflict and contradictions, potentially highlighting where change is in the making and a transition may be occurring. When initially conceptualised, an institutional logics approach focused on the identification of the logic/s associated with seven sectors of society, namely the family, the community, the religion, the profession, the state, the corporation and the market (Brodnik et al., 2017; Fuenfschilling & Truffer, 2014; Kooijman et al., 2017). Sectoral logics were further split into organisational fields, which encompassed the organisations and individuals interacting in particular processes within that field. Field logics guided the interaction and engagement of actors within each organisational field and a change in dominant practices was attributed to a change in the dominant field logic (Brodnik et al., 2017). Over time, as the concept of institutional logics has been more widely utilised, the simultaneous existence of multiple logics has increasingly been acknowledged

(Besharov & Smith, 2014; Higgins, Bryant, Hernandez-Jover, McShane, & Rast, 2016). More recent research has focused on the enduring multiplicity and co-existence of logics, and scholars such as Brodnik et al. (2017) have argued that this is a typical rather than temporal state. Higgins et al. (2016) argued that multiple logics can lead to ambiguity and confusion about organizational/individual purposes, roles and responsibilities and can create tensions that need to be negotiated in working towards new approaches. Often framed as being potential sites of conflict, Bryant and Higgins (2019) argued that logics can also provide sites for positive change.

An institutional logics framing has not been widely applied in studies of transitions but its use is not unique. For example, Bosomworth (2018) sought to understand the capacity of the fire management sector (a component of the country's climate change adaptation) in Victoria, Australia, to engage in transformative governance. She identified three logics that she believed were constraining the sector's capacity (at the regime level) to engage in transformative governance and argued that her findings highlighted the need for greater attention to be paid to socio-institutional dimensions of public administration when transformative governance of and for adaption was trying to be achieved. Smink, Negro, et al. (2015) utilised institutional logics in their exploration of the relationship between farmers and network operators in the Dutch natural gas grid - two previously unrelated actors who were forced to engage as a result of farmers producing biomethane that they injected into the national grid. Divergent logics were observed to be operating at the regime and niche levels in relation to the goals pursued, decision-making style and the scale of operations of network operations and farmers. Given the degree of embeddedness and stability of those logics Smink, Hekkert, and Negro (2015) argued that a transition towards more sustainable energy production as a result of successful biomethane injection was likely to remain elusive.

Institutional logics have also been used to explore transitions in water governance. Argued by Fuenfschilling and Truffer (2014) to be one of the most innovative water sectors in the

world, the Australian urban water sector has undergone significant change since the 1970s, and thus attracted the attention of a number of transitions scholars. Fuenfschilling and Truffer (2014) argued that the emergence of new logics had challenged the coherence of the structuration of the field and strength of the regime, making it more heterogeneous and thus open to change. In contrast Brodnik et al. (2017) argued that change resulted from the gradual co-evolution of logics over time, through periods of tension and alignment.

Given the illustration of a productivist logic in this doctoral research case, it is also relevant to note that productivist logics have been identified by others. Higgins et al. (2016) drew on an institutional logics framing to inform their exploration of what influenced the engagement of government agencies, industry bodies and farmers in biosecurity in Australia. They identified three logics through which participants engaged in biosecurity – neoliberal, productivist and agrarian logics; and argued that the productivist logic dominated how farmers viewed biosecurity responsibilities - prioritising production over all other considerations.

Institutional logics framings have also been drawn on by scholars in some New Zealand case studies. Turner, Klerkx, Rijswijk, Williams, and Barnard (2016) used an institutional logics framing to explore systemic problems that appeared to be preventing New Zealand's agricultural sector adopting a co-innovation approach to the development of agricultural innovation systems. Based on interviews undertaken with people involved with New Zealand's agricultural sector, Turner et al. (2016) identified three institutional logics that appeared to be linked to blocking mechanisms that hindered the establishment of co-innovation within the sector. In further work Turner et al. (2017) sought to identify opportunities to challenge the underlying institutional logics to facilitate the development of co-innovation within the sector. While they observed some success at the niche (project) level, they concluded that achieving change at the regime level remained elusive.

As interactions between the institutional logics that shaped the regional council's engagement in freshwater, and the individual identities of staff were illustrated, this section is concluded by noting that other scholars have drawn conceptual links between institutional logics and individuals' identities (Bevort & Suddaby, 2016; Glaser, Fast, Harmon, & Green jr, 2017; Thornton, Ocasio, & Lounsbury, 2012). Bevort and Suddaby (2016) argued that individuals reconstruct logics through their professional identities, and Glaser et al. (2017) contended that a person's identity mediated their interpretation of logics, and that organisational practices and identities reinforce and refocus the attention of individuals at the microlevel, as well as cultural evolution of logics at the macro-level. It was argued by Thornton et al. (2012) that change in practice and identity go hand in hand and a shift in logics entails a shift in an individual's underlying identities and practices. The extent to which changes in logics relate to changes in identities and practices was highlighted as a topic that required further research (Thornton et al., 2012).

An institutional logics response to research question

The institutional logics literature would suggest that what is shaping the governing of farmers, and the impact of their practices on freshwater are multiple institutional logics that frame the way that farmers and regional council staff engage in freshwater management, and therefore their thoughts about the potential feasibility, legitimacy, possibility and desirability of different solutions to the freshwater problem. The existence of multiple logics would likely create tensions that would need to be negotiated in working towards new approaches to freshwater governing in which farmers and the regional council were engaged.

2.5.3 Ways-of-knowing (WoK)

The influence that differing knowledge practices can have on an individual's or organisation's actions has been the focus of a range of theories. Research into knowledge cultures

(Tsouvalis, Seymour, & Watkins, 2000), ways-of-knowing (Duncan, 2016; van Buuren, 2009) and knowledge practices (Thomas, Riley, & Spees, 2020) has explored the challenges that can be experienced in environmental management as a consequence of multiple epistemologies needing to be accommodated, which was evident in this case. The approach that is reflected in this doctoral research is a ways-of-knowing approach. This approach resonated with the researcher, in part because it had been applied in a similar New Zealand context by Duncan (2016), who explored farmers' ways-of-knowing water quality and their encounters with policy relevant science in two locations in New Zealand's Canterbury region. A ways-of-knowing approach had also been applied in other water governance research (e.g. Brugnach, 2017; Gerlak & Mukhtarov, 2015).

Brugnach (2017) argued that a ways-of-knowing framing was based on a belief that knowledge was relational and found in relationships between actors. By relating to one another people could make sense of their experiences and form mutually reinforcing interpretations, beliefs and assumptions, from which a shared understanding and issues of common interest could emerge (Brugnach, 2017). Ways-of-knowing were described by Brugnach (2017) as the interpretative lenses through which people comprehend and respond to problem situations, connecting what they know with what they do. The knowledge of every actor is framed by their background, experience, societal position, values and beliefs, and differences in framing elicit distinct preferences, different kinds of knowledge and consequently the identification and preference for different solutions. Adoption of a ways-of-knowing approach means that one accepts that knowledge is not a neutral body of statements that objectively represents the functioning of the world (Brugnach, 2017). Feldman, Khademian, Ingram, and Schneider (2006) argued that people all know problems, and solutions, in collective, emergent, pragmatic, situated and historical ways. An individual's way-of-knowing emerges from their own day-to-day experiences, which could include working through financial spreadsheets, or managing soil erosion on

farm, or both in some cases, and it was through those experiences that people engaged in/with a problem, or solution, in different ways. An individual's way-of-knowing could arguably influence the institutional logics through which they engage in various activities. However, a link between the two concepts has not been widely reported in the literature. While there has been a growing recognition of the existence and value of a range of knowledges, many solutions have historically sought, and in some cases continue to seek, to reach agreement on solutions by relying on a single, agreed knowledge. It was contended by Brugnach (2017) that a ways-of-knowing approach does not seek to produce a single knowledge, but rather focuses on participants genuinely understanding the underlying worldviews and philosophies of those that practice different ways-of-knowing, and thus connecting (rather than eliminating) multiple ways-of-knowing.

The importance of experiential knowledge to farmers has been reported by others in the literature and was illustrated in this doctoral research also. An absence of experiential knowledge was argued by Blackstock et al. (2010) to likely result in the absence of a shared understanding about the case of diffuse pollution and reluctance of farmers to engage in discussions about potential solutions, as they didn't consider themselves to be part of the problem. The importance of establishing a mutual understanding about causes of diffuse pollution was also highlighted by Inman et al. (2018), based on their empirical work with farmers in three catchments in the United Kingdom.

Ways-of-knowing framings have been employed to explore knowledge practices in water management which Brugnach (2017) argued was the result of growing calls for new ways to organize governance and produce knowledge that addressed water management problems. The empirical work of Brugnach (2017) utilised a ways-of-knowing framing to explore groundwater exploitation in agricultural areas in central Spain and southern Italy. Significant decreases in available groundwater were experienced in both areas, and consequently plans were (at the time the research was undertaken) being developed to try and address water

scarcity issues. Brugnach (2017) observed that while in both cases multiple ways-of-knowing were evident, in the Spanish case, a range of strategies had been employed to encourage negotiation and dialogue that resulted in a plan being accepted by all stakeholders about how groundwater in the basin would be managed. In the Italian case actors had not engaged with each other, a plan had not been developed and the ever-increasing consumption of groundwater had continued. van Buuren (2009) adopted a ways-of-knowing frame for his examination of a collaborative governance process between Belgium (Flanders) and the Netherlands that related to the deepening of the Dutch Scheldt River, an ecologically unique estuary, that was also the fairway to the Belgian Port of Antwerp. van Buuren (2009) explored how decision-making had occurred through interviews with representatives of the various stakeholders involved, and observed that there were three different ways-of-knowing the estuary[14], but one had dominated the decision-making process. That led him to conclude that while desirable, knowledge inclusion processes cannot be managed, and are emergent, interactive, self-organizing processes in which all participants must be willing to do work if they are to succeed. Lejano and Ingram (2009) also used the concept of ways-of-knowing to inform their exploration of two policy initiatives that were introduced in an effort to unlock the legal and regulatory gridlock that had developed in relation to water issues in the California Bay-Delta area (United States). Their research focused at the micro-level highlighted the importance of relationships amongst policy actors that enabled different ways-of-knowing to be recognised and accommodated.

As noted above, in a New Zealand context, Duncan (2016) explored farmers' ways-of-knowing water quality. Her research has also been discussed in the water governance section of this chapter where the challenges presented by historical ways of working were

[14] The three WoK considered the Scheldt River to be: 1) an estuary, that was ecologically valuable and also vulnerable; 2) a fairway that could provide access to the port; and 3) a 'stake' in negotiations about a number of bilateral issues.

discussed. Duncan (2016) observed that farmers and science policy actors utilised quite different knowledge practices in relation to water quality. Informed by semi-structured interviews with farmers, Duncan observed that farmers drew on direct observation, intuition, their recollections of the past and their interactions with their soils and landscape to inform their views about water quality. As a result, they constructed an ontology of the water quality problem as intermittent, influenced by a range of uncontrollable forces and scientifically unknowable. In contrast, Duncan (2016, p. 155) observed that councils' knowledge practices were becoming more "black-boxed" than ever – increasingly relying on scientific models that standardised, aggregated, quantified and predicted things, thus assuming relatively homogenous landscapes. Informed by such models, science policy actors constituted the water quality problem as ever-present, quantifiable and a product of farmers not operating at or beyond good management practice. Duncan (2016, p. 155) argued that the "breadth of the chasm" between ways-of-knowing practiced by farmers and science policy actors of the council had increased, and new ways of working with divergent ways-of-knowing needed to be established to enable co-existence and opportunities for collaborative governance. That finding aligns with arguments made by other scholars such as Brugnach (2017, p. 35) that models and modes of knowledge production that genuinely took into account the knowledge and values of a range of groups of society remained "in the making".

Communities of practice, identified in Section 2.3.1 as also having a role in shaping farmer identity; also provide a space in which knowledge can be shared and collectively constructed. In a community of practice, Dolinska and d'Aquino (2016) argued, knowledge was considered to be an emergent property of social interaction rather than a commodity, meaning that communities of practice provide an opportunity to connect multiple ways-of-knowing.

A ways-of-knowing answer to research question

The ways-of-knowing literature would suggest that what is shaping the governing of farmers is the advice of others who adopt a similar way-of-knowing. In relating to one another people can make sense of their experiences and form mutually reinforcing interpretations, beliefs and assumptions, from which a shared understanding and issues of common interest could emerge. Given the different ways-of-knowing practiced by farmers and the regional council, a common problem framing had not been established, therefore discussions and ultimately agreement about potential solutions and appropriate ways of navigating the new space that is active governing of farming practices that impact freshwater by regional councils was likely to remain elusive.

2.6 Conclusion

Freshwater governance is a complex problem/issue, which can be viewed through a number of interpretive lenses. The sustainability transitions, farmer behaviour change and freshwater governance literatures were selected to inform this research and key insights from each literature have been highlighted in this chapter. These are now used to inform the overall research design, selection and methods, and provide a basis for analysis. With the theoretical basis now established, the empirical context is set out in the next chapter in which the physical, institutional and governance context for the case study is described.

Chapter 3. Case Description

3.1 Introduction

As outlined in Chapter One, this research focuses on farmers' and HBRC's experience with change associated with a sustainability transition for freshwater governance. To establish a context for the empirical analysis, the current chapter provides relevant background on the geographical, socio-economic and institutional setting (Evans, Gruba, & Zobel, 2014). It is organised as follows: a brief overview of the geographic setting of the case study location is initially provided (Section 3.2), followed by a summary of the history of European farming within the catchment (Section 3.3). While some Māori live within the catchment, and may well farm, none of the farmer participants identified as Māori, nor were locations such as marae identified as being particularly important meeting points by farmer participants. The Māori history of the area was not referenced by any participants, and was also not well recorded in written historical accounts that were readily accessible to the researcher. In contrast, the European history of the area was referred to by several farmer participants. Māori views and involvement in farming in the catchment were not a matter raised by farmer participants, however, the place of Māori in freshwater management and governing is significant. Some contextual information about te ao Māori[15] of the catchment is therefore provided in Section 3.2.3. The history of water governance organisations in the region is then explored as it is relevant to this case (Section 3.4). For at least a decade preceding the interviews for this research being undertaken, freshwater governing in New Zealand had been a matter of contention and almost constant change at both central government and regional level. Section 3.5 details happenings in the freshwater governing space at both the national and regional scales, involving both farmers and the regional council, that were relevant to contextualising the findings of this research.

[15] Te ao Māori is the Māori world view, that acknowledges the interconnectedness and interrelationship of all living and non-living things (Our Land and Water, 2019).

3.2 Study setting – the Tukituki Catchment

3.2.1 Physical characteristics of the catchment

The Tukituki River Catchment covers an area of approximately 2,500 km^2, and is located in the south of the Hawke's Bay region, on the East Coast of the North Island of New Zealand (Codlin & Van Voorthuysen, 2013), as shown in **Figure 3.1**. The catchment boundaries are closely aligned to those of the the Central Hawke's Bay District, and many participants (particularly farmer participants who lived in the area) spoke of Central Hawke's Bay (CHB) rather than the Tukituki Catchment when referring to the locality. The two terms (Tukituki Catchment and CHB) are used interchangably thorughout this thesis, as they were by participants. The Tukituki Catchment consists of seventeen sub-catchments, the locations of which are shown in **Figure 3.2**.

The Tukituki River, and its largest tributary the Waipawa River, both originate in the Ruahine Ranges, which effectively form the western edge of the catchment (Uytendaal & Ausseil, 2013). The rivers flow from their alpine sources across the flat and fertile Ruataniwha Plains, where many of catchment's settlements are located, before flowing down through the Tukituki Valley, and out into Hawke Bay, near the coastal settlement of Haumoana. The catchment has a varied topography, with the more intensive farms generally concentrated on the flatter land, particularly the Ruataniwha Plains, and farms located on the steeper hill country generally being of a more extensive nature.

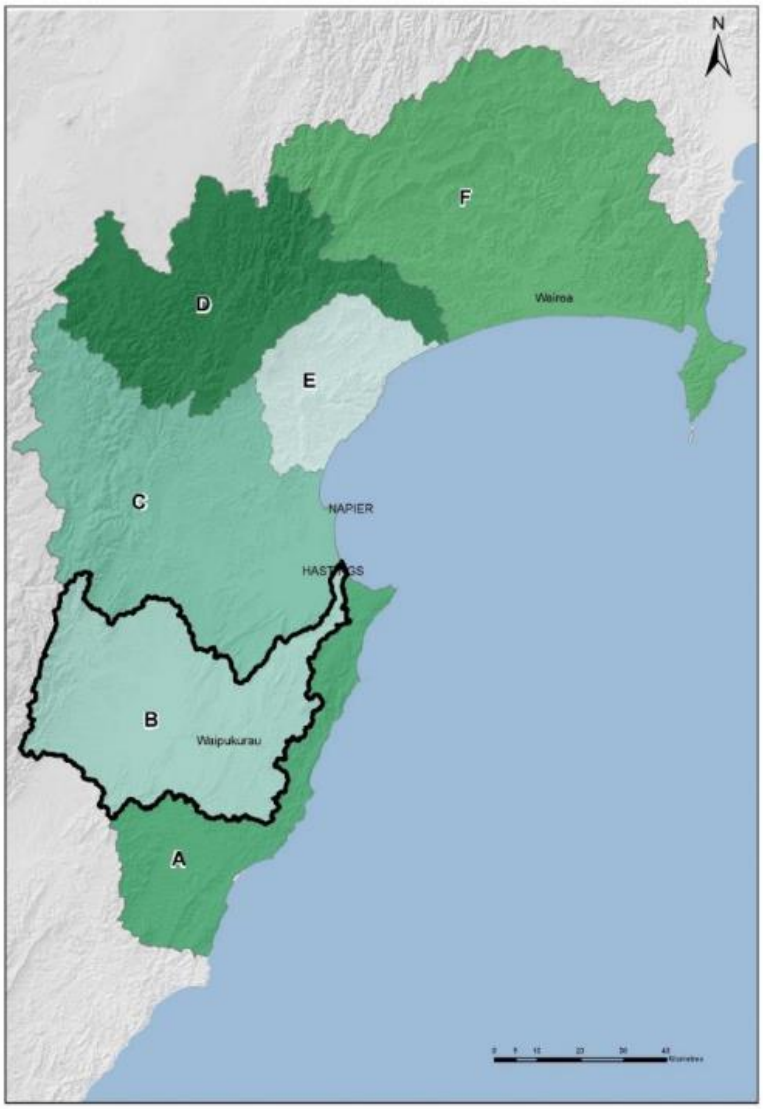

Figure 3.1. Location of Tukituki Catchment within Hawke's Bay Region*

Source: (Ausseil, Hicks, Wade, & Death, 2016, p. 6)

*The catchment boundary is indicated by bold black line. The letters A-F on Figure 3.1 denote the way HBRC grouped the regions catchments, and their associated work programmes. 'B' is the Tukituki Catchment.

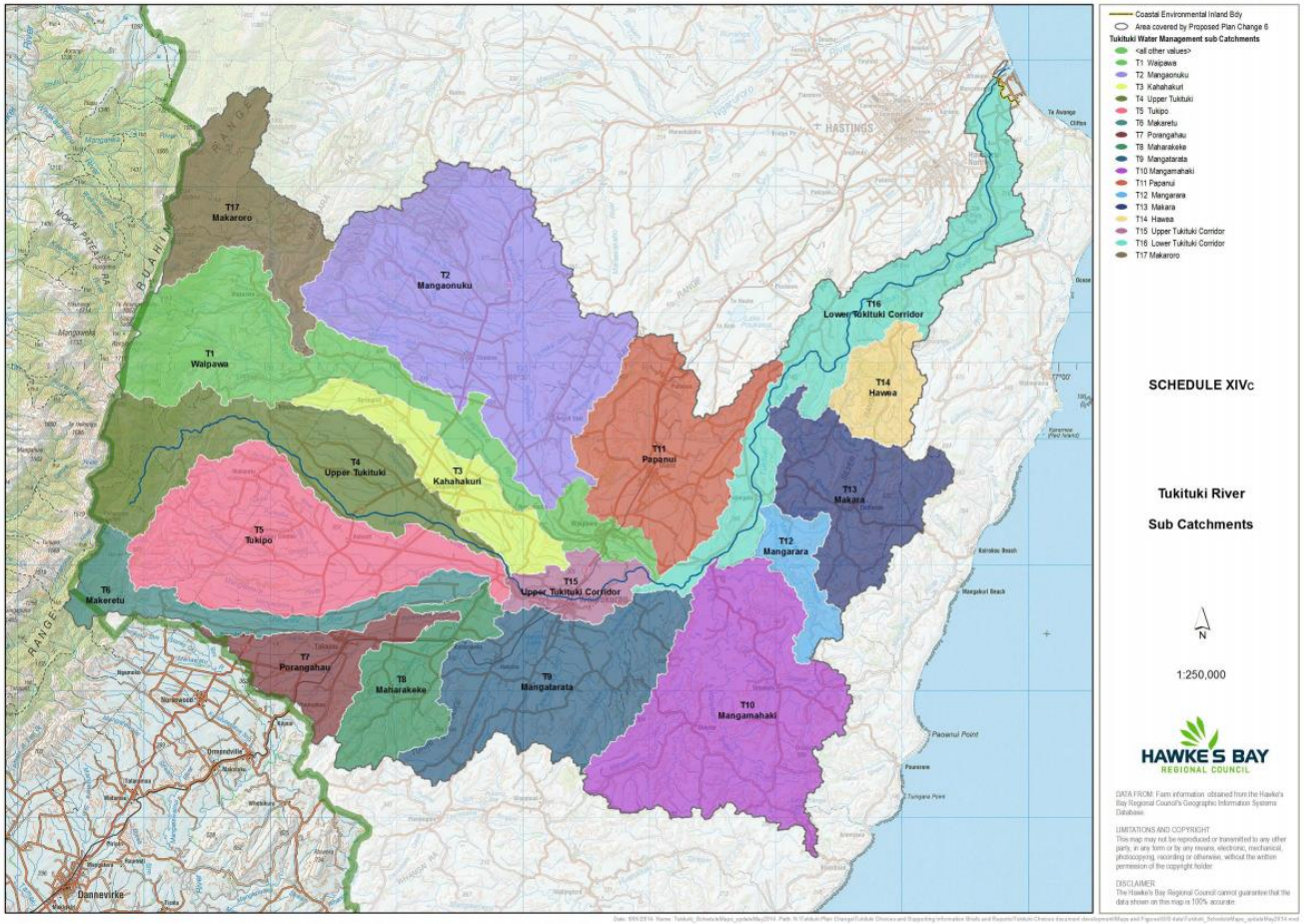

Figure 3.2. Sub-catchments of the Tukituki Catchment

Source: (Hawke's Bay Regional Council, 2015b, p. 3)

The Hawke's Bay region is characterised by a warm, dry climate with long periods of low rainfall and low river flow conditions. Tropical cyclones and subtropical depressions such as the devasting Cyclone Bola in 1988 can have significant impacts on the region, bringing periods of intense rainfall that can cause landslips and flooding (Uytendaal & Ausseil, 2013). Rainfall across the catchment can vary markedly, with the mountain ranges receiving over 2000mm/yr, and the Takapau Plains sometimes receiving less than 800mm/yr of rain (Chappell, 2013).

Land use change has had a significant impact on the landscape of the Tukituki Catchment (Uytendaal & Ausseil, 2013). Vegetation clearance, land drainage and land development have all been undertaken over the past 100 years, as has occurred in many farming areas of New Zealand. Vegetative cover is still dominated by native bush in the upper reaches of the catchment, but as the topography flattens out, large areas of land have been cleared for pastoral farming, and some blocks have also been planted in plantation forestry. The Ruataniwha Plains themselves are used almost entirely for pastoral farming, cropping and horticulture of varying levels of intensity. Irrigation demand within the catchment has increased over time, particularly during the summer months. This is not without its own effects, with scientific investigations suggesting that it has detrimental impacts on both ground and surface water quality and quantity (Uytendaal & Ausseil, 2013).

From a land use perspective, sheep and beef farming continues to dominate the Tukituki Catchment (Ausseil et al., 2016). Hill country land use within the catchment is predominantly low to medium impact dry stock farming and forestry; and on the flat land, particularly on the Ruataniwha Plains and around the settlement of Otane, more intensive farming enterprises such as dairying and arable cropping occur (Ausseil et al., 2016). There are two main towns in Central Hawke's Bay – Waipukurau and Waipawa, with a number of smaller rural settlements scattered across the Plains and along the coastline.

3.2.2 Social nature of catchment

At the time of the last census in March 2018, the population of the Central Hawke's Bay District was 14,142 people, who had a median age of 44.2 years. This represented a population increase of just over 10% since the 2013 census, similar to the national increase. Eighty-three percent (83.1%) of the population identified as being European, and 23.7% identified as Māori. At the national scale these figures were 70.2% and 16.5% respectively (Stats New Zealand, 2020).

The district's economic and social well-being is heavily reliant on the primary sector. Agriculture (including forestry and fishing) is the most significant employment sector in the district, accounting for around 30% of all employment (Central Hawke's Bay District Council, 2019).

3.2.3 Te ao Māori values

The Tukituki Catchment is highly valued by Māori who have ancestral links to the area, as well as those Māori that live within the catchment. There is evidence of a rich Māori heritage and at least seven to eight centuries of occupation, one of the earliest periods of settlement in New Zealand history (Te Taiwhenua O Tamatea in partnership with Te Taiwhenua O Heretaunga, 2012). The Tukituki River provides the hapū[16] that live in the area with a sense of identity and interconnectedness as it runs through their lives, and it was once a "river of villages" and a "highway" connecting whānau[17] to their food gathering places, to other whānau, to trade and to prosperity (Te Taiwhenua O Tamatea in partnership with Te Taiwhenua O Heretaunga, 2012, p. 44). Historically, the catchment had an abundance of food resources and mana whenua are still harvesting some of these to the present day.

[16] 'Hapū' is the Māori work that describes a kinship group or subtribe – a section of a large kinship group and the primary political unit in Māori society (Moorfield, 2021).
[17] 'Whānau' is the Māori word that describes extended family or a family group, and is the primary economic unit of traditional Māori society (Moorfield, 2021).

In 2012 a report was prepared to define key Māori environmental cultural values and their application within the Tukituki River Catchment (Te Taiwhenua O Tamatea in partnership with Te Taiwhenua O Heretaunga, 2012). The report was intended to inform HBRC's Tukituki Catchment Plan Change, and, it is contended in the report, that it was the first time that Māori perspectives had been recognised as part of a regional planning process (Te Taiwhenua O Tamatea in partnership with Te Taiwhenua O Heretaunga, 2012). The report stated that for mana whenua[18] the mauri[19] of water had become a critical issue and its deterioration was the result of poorly managed land use effects (Te Taiwhenua O Tamatea in partnership with Te Taiwhenua O Heretaunga, 2012). Concern was also raised that the use and integration of management regimes based on mātauranga Māori[20] and ecosystem management had not been given equal weighting alongside more scientific western knowledge and practices. The report included recommendations about how HBRC might integrate cultural values into the Tukituki Plan Change. The provision of greater opportunities for mana whenua participation in regional management and governance, and the development of a consistent planning approach that sought to improve the mauri of the catchment were amongst the recommendations (Te Taiwhenua O Tamatea in partnership with Te Taiwhenua O Heretaunga, 2012, p. 78).

[18] 'Mana whenua' is the Māori word that describes those people with authority over land. A tribe's history and legends are based on the lands they have occupied over generations and the land provides the sustenance for the people and to provide hospitality for guests (Moorfield, 2021).

[19] 'Mauri' is the Māori word that describes the life force or essential quality and vitality of a being or entity (Moorfield, 2021).

[20] 'Mātauranga Māori' is the Māori term used to describe Māori knowledge, being the body of knowledge originating from Māori ancestors, that includes the Māori worldview and perspectives, Māori creativity and cultural practices (Moorfield, 2021).

3.3 History of farming in Central Hawke's Bay

European sheep farming has had a proud history in Central Hawke's Bay with the first sheep arriving in 1849. The flock of 3,000 merinos were driven north from the Wairarapa, and since that time farming has formed an important part of the economy and society of Central Hawke's Bay (Pollock, 2015; Wright, 1994). Large-scale, low-intensity grassland sheep runs were established across Central Hawke's Bay by early European settlers, and a strong livestock industry developed (Dowling, 1999; Wright, 1994). In the 1850s, only six run holders controlled all of the best grazing land in the district (Central Hawke's Bay Settlers Museum, 2018). The dominance of large-scale pastoralists made it difficult for small operators to buy land and become established, and even when small blocks of land were offered for sale they were often snapped up by the large station owners (Central Hawke's Bay District Council, 2020). Descendants of some of the early settlers still farm in Central Hawke's Bay today.

Pollock (2015) argued that the 19th century owners of Central Hawke's Bay's large pastoral blocks developed into a New Zealand version of the English landed gentry – a social phenomenon that was also observed in Wairarapa and Canterbury. Pollock (2015) suggested that members of the Central Hawke's Bay pastoral elite even developed a distinctive accent, reminiscent of the English upper class, but given that few of the runholders actually came from privileged backgrounds, the accent was more likely to have been developed and adopted over time by pastoralists - secure in their status as Central Hawke's Bay's leading farming families. Pollock (2015) also argued that large scale land ownership gave the pastoralists elite power, both locally and nationally, as many leading pastoralists were appointed to top government jobs. Wright (1994) contended that those positions were virtually swapped from one leading pastoralist to another, ensuring that farmers had a significant influence on the development of government services such as health and education. The wealth generated by their large runs also enabled these farming families to

live a privileged lifestyle, with the construction of grand homesteads, such as Gwavas and Oruawharo which hosted social events such as balls, house parties and hunt meets which continued to be held well into the 20th century (Pollock, 2015). Some run holders had a particularly notable effect on the shape of the landscape of Central Hawke's Bay, founding townships on their land, such as Henry Bridge who founded Ongaonga in 1872, and Sydney Johnston who established Takapau in 1876.

Having a historical connection with the legacy of sheep farming in CHB emerged as being important to a number of farmer participants, particularly those that continued to farm family farms. This was illustrated by their knowledge of, and references to the history of farming in the area:

It had been farmed since the 1850s by the Tiffin Family, one of the early…it was part of the Elms Hills Station so it was one of the first farms in Hawke's Bay to run sheep cause the Tiffins and the Nairns bought sheep up the coast from the Wairarapa so it did have a long history (F5).

We've basically been in Hawke's Bay since 18..., well way back, and sheep and beef farming, and pretty traditional (F6).

Although initially sheep were the dominant species farmed in the area, beef cattle grew in number, with the region's beef-cattle herd eventually becoming the biggest in New Zealand (Cross, 1990). Sheep were initially farmed for their wool, but when refrigeration reached the region in 1884 farming sheep for their meat became more profitable and generally the primary source of income for sheep farmers. Freezing works opened to process sheep, and latterly other types of meat, and became major employers that also facilitated the growth of rural CHB towns such as Takapau where the freezing works still operates (Pollock, 2015).

Hawke's Bay's agricultural sector was revolutionised after World War Two, as occurred across New Zealand. Advancements in technology allowed land that had been abandoned

to be brought back into production, and also allowed small farms that had been carved off larger estates in fertile areas such as the Ruataniwha Plains to become economically viable (Wright, 1994). The development of new crops and other new technologies led to an enormous growth in agricultural output from the 1950s until the 1980s (Cross, 1990). Government incentives and subsidies were available to encourage farmers to take advantage of the latest technology (Valentine, Hurley, Reid, & Allen, 2007). However, the 1980s was to be a period of significant change and challenge for farming across New Zealand following the removal of farming subsidies. The difficulty of these times was amplified even further in the Hawke's Bay (and Gisborne) regions that were impacted by both drought and the devastating Cyclone Bola (1988). The hardship faced by farmers during that period of time was recalled by several participants:

The whole thing came crashing down, crashing down, in about 19....oh basically through the 90s, 87, oh basically mid 80s, 90s, and I got basically nailed (F6).

In 1984 when we bought the property the last day of subsidies was the day before our takeover […] [wife] remained dental nursing because we really needed her income to survive, and I just worked really hard. We just hung on, we just hung in there through the 80s (F12).

The entire Central Hawke's Bay community was arguably affected by the downturn of the 1980s due to its intimate relationship with the agricultural sector (Pollock, 2015). Like other rural areas throughout New Zealand, CHB experienced a loss of services such as banks and health care. However, most country schools and pubs, which provided important focal points for interaction amongst farming communities, remained open. Although there were some changes in land tenure, many farms (including those of 12 farmer participants) remained in family ownership, having been passed down through multiple generations.

Since the shock of the 1980s neoliberal reforms there have been few significant events that have impacted the farming community of CHB, and particularly the sheep and beef farming community, to the same extent. In other regions of New Zealand such as Southland, significant land use change from sheep and beef farming to dairy farming or large-scale dairy support, occurred in the 1990s/2000s, which had transformational impacts on the communities in those areas (Forney & Stock, 2014). The Tukituki Catchment remained relatively untouched by such land use change. The proposition of the Ruataniwha Water Storage Scheme would arguably have bought about the first significant, large scale contextual change in the catchment in almost three decades. The scheme would have provided those farmers that joined (four farmer participants indicated an intention to do so) with another tool to mitigate the impact of extended dry periods – an event that almost all farming participants identified as a key driver of practice change on their farms. Even for those farmers who could not join the scheme due to the geographical location of their farms, the scheme had been touted to deliver a range of other positive benefits for the broader Central Hawke's Bay community, including jobs and economic growth (Hawke's Bay Regional Investment Company, 2016). If the scheme had eventuated, it could have changed the way that farming was practiced on many farms within the Tukituki Catchment.

In addition to the uncertainty created by the proposed RWSS, farmers in the Tukituki Catchment were also not immune to the change in public opinion towards farmers that had occurred across New Zealand, and the results of this research showed that this did shape the freshwater management practices of farmers. Further discussion about that change in public opinion is provided in Section 3.5.3 that explores change in the freshwater governing space at both the national and regional scales in the years preceding this research being undertaken.

3.4 Water governing entities in Hawke's Bay

At the time this doctoral research was undertaken the responsibility for the management of freshwater in New Zealand had been devolved from central to regional government, and freshwater was required to be managed by the implementation of stricter rules and regulations that focused on the outputs of land based activities, particularly agriculture (Duncan et al., 2018). Regional councils were created by local government reform in the late 1980's and assumed most of the responsibilities that had previously been managed by catchment boards. In Hawke's Bay, and in the Tukituki Catchment in particular, the catchment board had been active in the construction of multiple flood control schemes and the delivery of soil conservation works, and consequently had engaged with and worked with many farmers in the catchment. This research illustrated that the relationships established between catchment board staff and farmers established expectations about how the catchment board, and latterly the regional council, would engage with farmers that have shaped current relationships between the two groups. Some further contextual information about the catchment board and its work is therefore provided in Section 3.4.1 below.

3.4.1 HBRC's predecessor - the Hawke's Bay Catchment Board

A severe storm that hit the Esk Valley just north of Napier in April 1938 has been suggested to have been one of the key events that compelled central government to enact the Soil Conservation and Rivers Control Act 1941 (Poole, 1983). The Soil Conservation and Rivers Control Act was one of New Zealand's first pieces of legislation that sought to comprehensively address concerns about river control and flood protection, and the accelerated soil erosion the country was experiencing (Poole, 1983; Roche, 1994). The Act required the establishment of a central Soil Conservation and Rivers Control Council that was comprised of representatives from different government departments, and also provided for the establishment of district level local government agencies called catchment boards and catchment districts (Roche, 1994). Catchment boards were comprised (if formed, as they

were voluntary) of a mix of elected representatives and government appointees, and also had the power to raise rates. Twelve catchment boards were ultimately established. Boards were established in the more flood and erosion prone areas of the country first, with the Hawke's Bay Catchment Board being one of the first to be established in 1943[21] (Roche, 1994).

Described by one participant as *the original stopbank builders (RC8)*, one of the main roles of catchment boards (at least initially) was to implement river control programmes. Boards were also responsible for the implementation of regional soil conservation programmes. However, given the priority afforded to river engineering works it was not until the 1950s that catchment boards' work related to soil conservation moved beyond an education and publicity campaign that sought to "win over" the rural community to the benefits of soil conservation (Roche, 1994, p. 65). Initially many farmers were opposed to the idea of soil conservation programmes due to concerns that such programmes would restrict the way that they were able to use their land and could therefore negatively impact their production and economic livelihoods. It was also contended by Roche (1994) that part of the reason for the delay in catchment boards actively engaging in soil conservation work was that land improvement was a motivating force of colonial settlement, and the human endeavour of converting forest to pasture had previously been regarded as unquestionably good. Despite the delay in catchment boards becoming actively involved in soil conservation programmes, between 1952 and 1967 the Hawke's Bay Catchment Board planted the most acres of trees of any catchment board in New Zealand (Roche, 1994).

As a consequence of growing concern about water quality, water pollution and water allocation, in 1967 the Water and Soil Conservation Act was introduced which was purported to provide a more comprehensive legislative framework (than the Soil Conservation and

[21] The first catchment boards were established in 1943 in Manawatu, Nelson and Hawke's Bay (Roche, 1994).

Rivers Control Act) that was necessary to meet increasing water management challenges (Roche, 1994). The Water and Soil Conservation Act established additional water management authorities such as the National Water and Soil Conservation Authority and regional water boards. Catchment boards also remained in existence and were responsible for administering both the Soil Conservation and Rivers Control Act, and Water and Soil Conservation Act at the catchment scale (Roche, 1994). Arguably it was not until the introduction of the 1967 Act that catchment boards actively assumed a role in managing water for quality purposes, which Roche (1994) contended was not surprising given the colonial belief in inexhaustible resources and a utilitarian attitude that emphasised the efficient use of water over water quality.

Ultimately catchment boards became responsible for three different but related functions – namely flood control and drainage, soil conservation, and water pollution and allocation. Based on his critical review of the public value of regional government in New Zealand, McNeill (2008) argued that the differences between those multiple functions were never resolved and consequently catchment boards essentially operated as three separate parts: one part that consisted of engineers working on flood control schemes; another comprised of soil conservators developing land use plans and planting trees to reduce erosion; and a third section managing pollution and water allocation by issuing water rights (McNeill, 2008). In terms of the catchment board's role as *stopbank builders (RC8)* in the Tukituki Catchment, the Upper Tukituki Flood Control Scheme was the first major scheme built by the Hawke's Bay Catchment Board. It was established during the 1930s and 1940s and involved the construction of stopbanks as well as living tree edge protection (Ausseil et al., 2016). The scheme involved significant work on both the Tukituki and Waipawa Rivers, as well as a number of smaller tributaries and heavily modified land drainage within the catchment (Ausseil et al., 2016). In the 1980s, stopbanks were also constructed in the lower part of the Tukituki Catchment (Ausseil et al., 2016).

Although smaller in scale, another flood scheme overseen by the catchment board and of relevance to this research is the Upper Makara Catchment Control Scheme. The Makara Scheme as it was known was described by a regional council participant who had done a lot of work on it as *probably involved no more than about 20 farmers, it was quite small (RC8)*. Four farmer participants farmed within the Makara Scheme area and paid the targeted rates that were collected from landowners that benefited from the operation of the scheme. Like many flood control schemes, the construction of the Makara Scheme started in the late 1970s after landowners approached the catchment board for assistance after experiencing a number of serious flood events during the 1970s (Hawke's Bay Regional Council, 2020). The scheme involved a series of dams that controlled flood flows and helped to improve the productivity and stability of 800ha of river flats within the catchment . Soil conservation works (mainly willow and polar planting in the gullies) as well as some retirement fencing were also undertaken as part of the scheme on around 2,225ha of hill country – including on the farms of some farmer participants. A significant portion of the cost of the scheme was covered by central government, as recalled by one participant:

It got something like, and I can't remember this exactly, but it got something like 70 percent government subsidy, it got a huge amount of subsidy. So it got the subsidy and then they had to…I think the Catchment Board put in 10 percent, and then the farmers on top of all their other rates and everything else had to pay that extra bit (RC 8).

Central government funded such works because soil conservation had been recognised as being interlinked with the ability of the primary sector to remain profitable, and ultimately the welfare of New Zealand's economy (Roche, 1994). In Hawke's Bay, a lot of soil conservation work was undertaken on individual properties, rather than as comprehensive schemes, and mainly involved poplar, willow and pine plantings with the catchment board establishing its own nursery to grow trees for conservation works (Regnault, 1996). In later years, as the rate of stopbank building and associated soil conservation schemes decreased,

catchment board staff dedicated most of their time to the development and supervision of farm plans, which involved work alongside farmers to identify areas that required soil conservation works, and the development of a plan to undertake the required works (Cross, 1990).

3.4.2 Establishment of the Hawke's Bay Regional Council

The first Hawke's Bay Regional Council was elected in late 1989, in accordance with the Local Government Amendment Act (Roche, 1994). This new regional government entity assumed the responsibilities and work previously undertaken by the Hawke's Bay Catchment Board, the Regional Water Board, the Hawke's Bay United Council[22] and various pest destruction boards (McNeill, 2008).

In many regions, and as was the case in Hawke's Bay, a large majority of the staff and management in newly formed regional councils came from catchment boards, and McNeill (2008) argued that this resulted in the cultures of catchment boards tending to dominate. For some time after their establishment, the focus of many regional councils remained on soil conservation and the removal of noxious plants and animal pests (including rabbits), which required ongoing engagement with the rural sector. Regional councils also assumed public transport and regional civil defence functions (transferred from united councils). However, McNeill (2008) contended that particularly in provincial regional councils these functions were, at least initially, an almost insignificant part of councils' operations.

The re-organisation of local government was quickly followed by major legislative reforms, the most significant of these (in the natural resource management space) being the introduction of the Resource Management Act (1991) (RMA) ("Resource Management Act," 1991). The functions of regional councils were set out in Section 30 of the RMA as including

[22] The Hawke's Bay United Council was formed in 1983. United Councils were charged with planning, including the development of regional schemes under the Town and Country Planning Act (1977); and civil defence (McNeill, 2008).

the integrated management of the natural and physical resources of the region; control of the use of land for the purposes of soil conservation, maintenance and enhancement of the quality and quantity of water in water bodies and coastal water, and the ecosystems in them; avoidance or mitigation of natural hazards; identification and monitoring of contaminated land; and management of the coastal marine area ("Resource Management Act," 1991). At the time of writing, the RMA remained in place and continued to be the main piece of legislation that governed the management of New Zealand's natural resources, including freshwater. However, significant reform of the RMA, and replacement with three smaller pieces of legislation had been recently promised by central government to start to be rolled out before the end of 2021 (Daalder, 2021). Spiller (2003, p. 100) argued that the RMA "sought to introduce a paradigm shift in the philosophy and practice of development control", moving from activity based planning to effects based planning. The RMA relied on a hierarchical decision-making structure whereby central government established overarching national policy statements that set broad objectives for resource use, regional councils set rules for resource use through regional policy statements and regional plans, and district councils did for their district through district plans. As already noted, the first central government legislation relating to freshwater, the National Policy Statement for Freshwater Management, was not introduced until 2011 – some 20 years after the RMA was enacted.

Regional councils assumed significant responsibilities for resource management under the RMA, building on their existing responsibilities, and McNeill (2008) argued that this redirected their focus from service delivery to regulation. The management of natural and physical resources was clearly identified by the RMA as being the primary focus of regional councils, and it was argued by McNeill (2008) that such a focus lead to the social and economic planning expertise and institutional knowledge that had been developed within more forward thinking united councils dissipating after the 1989 local government reform,

and that a gap in those skill sets continued to exist in some regional councils even 20 years after the RMA came into effect.

The RMA required regional councils to prepare planning documents that set out the regulatory framework that was to guide the management of resource use activities across each region. In the Hawke's Bay region five draft plans were prepared. A regional river bed gravel extraction plan (1994), a regional waste and hazardous substances plan (1995), a regional air plan (1998), and a regional water resources plan (2000) were all developed and made operative by the regional council (Hawke's Bay Regional Council, 2006). A regional hill country erosion plan was also drafted. However, as the proposed plan and rules generated considerable opposition from the community, the council chose to withdraw the plan and instead pursue a "self-regulation approach to land management" (Regnault, 1996, p. 79). This meant that there was no pro-active regulatory control over hill country erosion in Hawke's Bay until 2006 when the four plans listed above were combined into one plan (the Hawke's Bay Regional Resource Management Plan (RRMP)[23]) to which a new policy framework for land management (amongst other things) was added (Hawke's Bay Regional Council, 2006). Arguably because of the delay in a regulatory framework related to hill country erosion being introduced in the Hawke's Bay region and few farmers had interacted with the regulatory sections of the regional council.

Based on the findings of research that explored the approaches of regional councils to soil conservation under the RMA, Regnault (1996) argued that HBRC had encouraged a partnership approach to sustainable land management that focused on information provision, education and facilitation. A staff member interviewed as part of her research opined that HBRC's advocacy approach derived from the pastoral sector's history (in the region) of non-regulation and a political reluctance to take a "heavy handed regulatory

[23] For completeness it is noted that there was also a Hawke's Bay Regional Coastal Environment Plan (1999). However, as that related only to the coastal marine area, it is not relevant to this case study.

approach" (Regnault, 1996, p. 84). As part of their facilitation approach, the regional council had (and at the time of writing continued to have) made funding available to assist farmers with soil conservation works which had provided an opportunity for council staff to continue to work in partnership with farmers within the Tukituki Catchment to undertake soil conservation work on their farms. While the eligibility criteria to qualify for funding has changed over time, several farmer participants spoke of accessing subsidies to finance soil conservation works on their farms. One farmer described a feeling of partnership with HBRC as a consequence of the funding he had received:

I sort-of feel like they're partners in our farm because they've contributed to what we've built (F10).

While there have been changes to the way that the regional council has approached soil conservation work over time, the manner in which soil conservation work has been undertaken by the regional council has remained generally consistent – council land management staff working alongside farmers in a partnership style to improve soil conservation. The consistency of the soil conservation approach contrasts with the multiple changes in approach to freshwater governing that have occurred and are explored in the next section of this chapter.

3.5 Changes shaping freshwater governing

3.5.1 Ongoing central government freshwater reform

Changes to the way that freshwater in New Zealand is governed have arguably been in progress since at least 2003 when the government established the Sustainable Development Programme of Action, that included a Sustainable Water Programme of Action (New Zealand Government, 2003). The Sustainable Development Programme of Action was established in an effort to build on work undertaken prior to the 2002 World Summit on Sustainable Development that sought to review progress towards implementation of the sustainable

development goals set out in Agenda 21, the primary outcome of the 1992 Rio Earth Summit (J. Wilson, 2002). One of the first tangible outcomes of the Sustainable Water Programme of Action was the December 2004 release of a freshwater discussion document (Anderton & Benson-Pope, 2006). Widespread public consultation was undertaken in relation to the document that informed the identification of three national outcomes and a number of specific actions for freshwater that included the need to draft a national policy statement for freshwater management. In June 2008 a draft National Policy Statement for Freshwater Management (NPSFM) was publicly notified and a BOI was established to hear submissions and make recommendations on the draft. In November 2008 a new National Government was elected, replacing the three-term Labour led government, which lead to further freshwater reform. In June 2009, a 'New Start for Fresh Water' was announced that focused central government efforts in three particular areas of water management, namely 1) the establishment of a national level collaborative group for the purpose of developing a shared understanding of potential options to achieve improvements in freshwater management, 2) ongoing engagement with Māori on matters related to freshwater, and 3) the scoping of policy options in six particular areas of freshwater management in which central government wanted to take a new approach (New Zealand Government, 2009).

The collaborative group established was called the Land and Water Forum (LAWF) and brought together over 60 stakeholder groups, including environmental and industry groups, iwi and scientists; and meetings were also attended by active observers from local and central government (Rouse & Norton, 2016). Rouse and Norton (2016) argued that the LAWF contributed to a major shift in how freshwater planning was done in New Zealand through their discussions, and also that the group's first report was one of the driving forces behind the eventual gazettal of the first NPSFM in 2011. The arguments of Rouse and Norton (2016) are arguably supported by the fact that despite having received in January 2010 the BOI's recommendation report on the NPSFM, the Minister for the Environment delayed his

consideration of the Board's recommendations until September 2010 - when he received the report from the LAWF (Ministry for the Environment, 2011b). Entitled 'A Fresh Start for Freshwater' the LAWF report stated that while the overall quality of New Zealand's freshwater was still good, and (at the time) rated well internationally, its quality and availability were deteriorating (Land and Water Forum, 2010). The LAWF identified the absence of numeric limits for various freshwater parameters and active management to ensure those limits were achieved as the most significant barriers to effective freshwater management in New Zealand at the time.

The NPSFM11 finally came into effect on 1 July 2011 (New Zealand Government, 2011). As recommended in the LAWF report, the NPSFM11 included objectives and policies that directed regional councils to manage water in an integrated and sustainable way "while providing for economic growth within set water quantity and quality limits" (New Zealand Government, 2011, p. 3). The NPSFM11 introduced for the first time since the local government reform of the 1980s, a freshwater regulatory framework that had been drafted at central government level. Freshwater governing in New Zealand had historically been focused at the catchment/local scale and undertaken by regional government, with limited involvement or direction from central government. In fact it was argued by Fenemor (2017) that New Zealand had one of the most devolved water governance regimes in the world, and that central government had a weak role in managing water allocations and water quality outcomes which were the primary objectives of water management.

The NPSFM11 required a raft of actions by regional councils that included setting numeric limits to improve water quality; addressing over-allocation of water quantity; the preparation of progressive implementation programmes (ie. setting of timeframes within which limits and targets would be achieved), as well as further work with tangata whenua to facilitate their interests in freshwater management (Ministry for the Environment, 2011a). The use of collaborative approaches to assist the development and operationalisation of

freshwater plans were also strongly encouraged (Cradock-Henry et al., 2017). As part of the 'New Start for Freshwater' programme central government also established the Irrigation Acceleration Fund which made available up to $NZ35 million of central government funding (over 5 years) to help develop more effective and efficient irrigation infrastructure (Ministry of Agriculture and Forestry, 2012). The HBRC's application for funding for the Ruataniwha Water Storage Scheme (discussed in further detail in Section 3.5.2) was the first application to be granted by the fund and the project ultimately received almost $NZ7 million[24] of central government funding (Hawke's Bay Regional Council, 2017b).

The introduction of the NPSFM11 created an accountability for regional councils to central government that, while always present, had arguably not shaped the behaviour of regional councils to the same extent that the gazettal of the NPSFM11 did. Regional councils had always been accountable to central government and required to carry out governing functions as set out under the RMA (as catchment boards had been required to do by earlier environmental legislation). However, the NPSFM11 made regional councils more visibly accountable by requiring them to publicly report on the achievement (or not) of a number of scientific metrics, and subsequent versions of the NPSFM (2014 and 2017) have only increased such reporting requirements. Not only did this increase the visibility of the work of regional councils at central government level, but it has also made regional councils more visibly accountable to the public – a public whose interest in environmental matters had increased over time.

Further reform of New Zealand's freshwater management system was undertaken by central government to address the ongoing decline of water quality in some catchments.

[24] The $NZ7 million was from the Irrigation Acceleration Fund and Crown Irrigation Investment Ltd (Hawke's Bay Regional Council, 2017b). Crown Irrigation Investment Ltd was established in 2013 to facilitate the development and construction of off-farm regional irrigation infrastructure that were expected to generate long-term economic benefits for New Zealand. As a result of the 2017 change in government, the fund was essentially shut down, and no longer takes new applications (Crown Irrigation Investments Limited, 2020).

'Freshwater reform 2013 and beyond' included eleven further reforms that were intended to enable more effective freshwater governance (Ministry for the Environment, 2013). In 2014 an updated NPSFM (NPSFM14) came into effect that Rouse and Norton (2016) argued provided greater support and direction to regional councils in their efforts to manage freshwater and was also expected to improve the consistency of NPSFM14 implementation across the country. The NPSFM14 was superseded by a further version in August 2017 (NPSFM17), and then again in 2020 (NPSFM20) (New Zealand Government, 2020). Further central government funding was also made available in 2017 (up to $NZ100 million over 10 years) to support the improvement of freshwater in vulnerable catchments (Ministry for the Environment, 2020). Although a number of projects within the Hawke's Bay region received money from the fund, none of them were located within the Tukituki Catchment. As already noted, at the time of writing, reform of the Resource Management Act was being advanced by central government, and supposed to be starting to roll out by the end of 2021 (Daalder, 2021).

Before further contextual information is provided about matters related to freshwater governing in the Tukituki Catchment itself, it is relevant to highlight the range of approaches that have been taken by regional councils to freshwater management planning. In the neighbouring Manawatu-Whanganui Region, the regional council made changes to their regional plan through the 'One Plan' process which set objectives, policies and rules relating to freshwater that applied across the entire region (i.e. the council did not take a catchment by catchment approach) (Manawatu-Wanganui Regional Council, 2007). The One Plan process pre-dated the NPSFM11, as the plan was notified in 2007. However, the Council believed that it largely gave effect to the NPSFM11 (Ministry for the Environment, 2017a). The Canterbury Regional Council developed both the Canterbury Water Management Strategy and the Canterbury Land and Water Regional Plan. Completed in late 2009 (therefore again predating the NPSFM11), the strategy set out an overall framework for

freshwater management across the region and set ten targets (Canterbury Mayoral Forum, 2009; Ministry for the Environment, 2017b). Implementation of the strategy was managed by ten zone[25] committees (facilitated collaborative groups) who developed zone specific implementation plans that outlined how the water management strategy would be implemented within each zone. The land and water plan, notified in 2012, set some region wide provisions about how land and water was to be managed, and then subsequent plan changes have incorporated zone specific water quality regulations into the plan that were based on the work of zone committees with their communities (Ministry for the Environment, 2017b).

The Hawke's Bay Regional Council decided to tackle its freshwater management challenges on a catchment by catchment basis (Ide & Codlin, 2012). Through the development of the Regional Land and Water Management Strategy the Tukituki Catchment had been identified as the catchment of highest priority for action in the Hawke's Bay region, therefore it was logical that it was the first catchment for which a catchment specific plan change was prepared (Hawke's Bay Regional Council, 2011a). Although the Manawatu-Whanganui Regional Council and Canterbury Regional Councils had started freshwater management planning processes, as those predated the NPSFM11, the Hawke's Bay region was one of the first regions in New Zealand to undertake a plan change process that sought to implement the NPSFM11.

3.5.2 Tukituki's changing freshwater management framework

In addition to change at the national level, the years preceding this doctoral research were also characterised by ongoing change in freshwater management at the regional level, sparked initially by an extended period of drought in CHB. Three consecutive years of

[25] The Canterbury region was divided into zones that were intended to enable the management of abstraction from surface and groundwater systems to be integrated with the management of the irrigated areas where the water was used (Canterbury Mayoral Forum, 2009).

drought in Central Hawke's Bay from 2006 to 2008 had resulted in extended irrigation ban periods[26] that had fuelled concern amongst irrigators about the state of the Tukituki River Catchment. Prolific growth of algae and slime in the lower Tukituki River, caused by low river flows, had also fuelled public debate about the way the regional council had managed the Tukituki River (Codlin, 2013). There were widespread calls for change and improvement in the way that the regional council managed both water quantity and quality in the Tukituki Catchment (Codlin, 2013). It was contended by Memon, Painter, and Weber (2010) that provincial regional councils that had historically been dominated by rural landowners (as HBRC had been) had been reluctant to address water allocation conflicts or undertake rural land use regulation to address non-point source pollution. They argued that it was the 2005 RMA amendments[27] that had resulted in regional councils becoming cognisant of and actively engaging in their strategic water-planning role.

In 2008 the Hawke's Bay Regional Council embarked on a process of trying to develop a more strategic and integrated approach to managing the region's land and water resources (Codlin, 2013), arguably lending support to the arguments of Memon et al. (2010). One of HBRC's first actions was to hold a series of internal workshops that identified 14 strategic issues for the region. These were incorporated into a document called 'Embracing Futures Thinking' which was used to facilitate discussion with stakeholders and the wider community (Codlin, 2013). In the Council's 2009-2019 Long Term Plan six of those strategic issues were identified as key foci for the next ten years, including water and land (Codlin, 2013). At a similar time, the regional council also undertook a scenario planning exercise that involved interviews with 70 Hawke' Bay leaders and a workshop. The information gathered was used

[26] For example, in 2007/08 irrigators linked to the Waipawa River were unable to irrigate for 17 consecutive days.

[27] The 2005 RMA amendments introduced new requirements about what regional plans had to contain, and also provided the Minister for the Environment with the ability to direct changes to be made to regional policy statements and plans ("Resource Management Amendment Act ", 2005).

to help develop three possible futures for Hawke's Bay (Bates, 2010). The project (called Land, Water, Us) was publicly launched at a regional water symposium held in November 2010. The symposium was intended to help develop a shared understanding of the range of values associated with the region's water resources, improve trust and relationships among the region's water stakeholders and inform the direction of a draft regional water strategy (Hawke's Bay Regional Council, 2010). One hundred and fourteen participants representing 42 organisations attended the two-day event (Hawke's Bay Regional Council, 2010). At the conclusion of the symposium nominations were sought for members of an external reference group that would assist HBRC staff to draft a water strategy for the region. Twenty-one members were selected, three of whom were actively farming at the time (Hawke's Bay Regional Council, 2011a).

The 2010 symposium focused on matters relating to water quantity. HBRC had initially intended that matters relating to water quality would be dealt with at a similar event the following year. However, the reference group quickly recognised that issues related to land use and water quality were intimately connected with matters relating to water quantity and therefore must all be considered together (Hawke's Bay Regional Council, 2011b). Consequently, rather than just a water strategy, the Hawke's Bay Land and Water Management Strategy was prepared and presented at a second water symposium held in November 2011 (Hawke's Bay Regional Council, 2011b). The strategy included a discussion about drivers for change in the way that land and water resources in Hawke's Bay were managed, and the need for a more integrated regional approach. The strategy identified values associated with land and water (at a regional scale), and objectives, policies and actions that were intended to improve land and water management in Hawke's Bay. The strategy also identified priority actions for HBRC. The Tukituki Catchment was identified as the top priority as a result of issues related to aesthetic water quality, aquatic habitat health, over allocation, potential irrigation demand, potential land use intensification, an impacted

trout fishery and impacts on angling and recreational activity (Hawke's Bay Regional Council, 2011a).

In 2012 HBRC commenced the formal policy development process for the Tukituki Catchment. As part of that process, HBRC prepared and released for consultation a document called 'Tukituki Choices' which used a scenario planning approach to gather public feedback about approaches that could be adopted in the plan change process that might be acceptable to the community. Four scenarios were proposed, and two of those assumed that water storage would be constructed within the catchment[28] (Hawke's Bay Regional Council, 2012). Alongside the policy development process, a decision was also made by the regional council to advance work on a water storage project within the catchment, that if constructed would help meet flow, water security and water quality objectives that were expected to be introduced by the proposed new plan. What became known as the Ruataniwha Water Storage Scheme was a nationally significant proposal that involved the construction of a large-scale dam that would enable water storage and subsequent irrigation, funded by both public and private investment (Hawke's Bay Regional Council, 2017b). The idea was promoted as being an "unprecedented intervention for any regional council in New Zealand" (Hawke's Bay Regional Council, 2017b, p. 2) as the organisation took "the role of an environmental regulator into the higher risk realm of using its financial balance sheet to more actively enable change". The scheme could have enabled up to 25,000ha of additional CHB farmland to access reliable water if it proceeded (Codlin & Van Voorthuysen, 2013).

The 'Tukituki Proposal', as the RWSS and Tukituki Catchment Plan Change package was known, was a first for New Zealand in that the catchment specific plan change was heard

[28] At the time that 'Tukituki Choices' was released (September 2012) feasibility studies had been undertaken to investigate whether water storage was possible, but a decision had not been made about whether the project would be advanced.

alongside applications for resource consents required to construct the RWSS. HBRC argued that

"traditional planning processes that were available to it for Change 6[29] and the Ruataniwha Water Storage Project would not provide the level of integrated decision-making, certainty and timeliness of the decisions necessary for such a significant strategic response to a resource management issue" (Codlin & Van Voorthuysen, 2013, p. 5).

Described by one regional council participant as *a very ambitious leadership step (RC20)*, the proposal for the regional council to become involved in the storage and supply of freshwater at an operational level signalled a change in approach from the regional council, as the organisation had not previously been involved in major infrastructure water supply projects and were not required by legislation to be. The Tukituki Proposal was promoted as a package, which led to confusion in the community about whether or not the Tukituki Plan component of the proposal would be advanced if the dam was not constructed, as illustrated below:

If it had of been a standalone plan change that wasn't called in[30], it wasn't with Ruataniwha, (a) you would have had more genuine engagement from the perspective that you're going to need now, and (b) you wouldn't have attracted so much attention from the NGOs as we got (RC21).

The dams had so much focus I think that it's only really in the last - yeah the people have just not - it's all [the Tukituki Plan] gone over their head really (RC23).

[29] 'Change 6' or Plan Change 6 is another term by which the Tukituki Plan Change was known. The term Tukituki Plan Change is preferred and used throughout this thesis by the author, but where either of the alternative terms have been used by others, they have not been changed. For clarity, Change 6, Plan Change 6 and the Tukituki Plan all refer to the same piece of regional council regulation.

[30] 'Called-in' was the term given to the process of the Minister of Conservation 'calling in' an application or plan change and having it heard by a central government appointed Board of Inquiry, rather than by regional councillors or independent commissioners, which is the usual process of hearing such matters (Ministry for the Environment, 2021).

For clarity, it is noted that the plan change did have to be progressed, with or without the RWSS, to ensure that the regional council's obligations under the NPSFM11 were met.

The proposal attracted a large amount of national attention and was strongly criticised by environmental groups such as Greenpeace, Fish and Game, and Forest and Bird who became heavily involved in what became a highly contested process (Board of Inquiry (BOI) into the Tukituki Catchment Proposal, 2014). Rather than being heard by a council-elected hearing panel, HBRC sought, and were granted, a direct referral to the Wellington-based Environmental Protection Authority which meant that the proposal was jointly heard by a special tribunal (called a Board of Inquiry (BOI)) that was elected by the Minister for the Environment (Board of Inquiry (BOI) into the Tukituki Catchment Proposal, 2014). The elevation of the proposal to a central government level arguably resulted in the involvement of national representatives of submitter organisations such as Forest and Bird, rather than local members of those organisations with whom the regional council had undertaken consultation and had the opportunity to discuss the proposed nutrient framework that focused on phosphorus (Codlin & Van Voorthuysen, 2013). Arguably the involvement of many national actors, rather than local/regional actors, resulted in the regional council's proposed nutrient management approach being challenged, and ultimately changed, by the BOI to focus on nitrogen. Nitrogen had been the nutrient of focus in national level debates about nutrient management (Board of Inquiry (BOI) into the Tukituki Catchment Proposal, 2014) and the focus of other regional councils' freshwater management regulations. However, the Hawke's Bay Regional Council had decided to focus on reducing phosphorus levels within the Tukituki Catchment because land use in the catchment continued to be relatively extensive, and phosphorus had been identified as the key limiting nutrient (Ausseil et al., 2016). The council's proposed approach to focus on phosphorus reduction would have enabled the council to continue (to a greater degree) to engage with farmers in a manner that was more consistent with the way the organisation previously had. Council land

management staff had expertise in such work, and a continued focus on phosphorus could have enabled soil/land to remain the focus of the relationship between council staff and farmers – a topic that both groups had knowledge and experience in dealing with. However, the BOI that heard the Tukituki Proposal (including the Tukituki Plan) changed the plan to focus on nitrogen, a nutrient that does not attach to soil but is instead dissolved in water and therefore its movement is not as visible as that of phosphorus. This change in the focus of the Tukituki Plan necessitated a change in the way that the Hawke's Bay Regional Council engaged with farmers, as engagement had historically focused around soil, but needed to shift to a freshwater focus.

Without going into unnecessary detail, the timeline below illustrates the series of events and extended period of time over which uncertainty about freshwater management in the Tukituki Catchment persisted:

1) 'Tukituki Proposal' notified: July 2013.
2) Draft BOI decision issued: April 2014.
3) Final BOI decision issued: June 2014.
4) Decision on High Court Appeal of BOI decision (by Fish and Game, Forest and Bird, Environmental Defence Society): December 2014.
5) Final BOI decision (post High Court decision): April 2015.
6) Tukituki Plan Change operative: October 2015.
7) High Court Appeal re Department of Conservation land swap for RWSS (Decision to 'grant' land swap appealed by Forest and Bird): February 2016.
8) Court of Appeal decision re Department of Conservation land swap for RWSS (Decision to 'grant' land swap appealed by Forest and Bird): August 2016.
9) Local body elections: October 2016.
10) HBRC order review of RWSS: November 2016.

11) Supreme Court decision regarding Department of Conservation land swap for RWSS (Decision to 'decline' land swap appealed by Minister of Conservation and Hawke's Bay Regional Investment Company): July 2017[31].
12) HBRC withdrew funding from RWSS: August 2017.

Events 9, 10 and 12 in the list above warrant additional commentary. In addition to the national attention that the Tukituki Proposal attracted, it also created significant debate at a regional level. Members of the community expressed strongly held views about whether the regional council should be engaging in freshwater management at a practical, operational level. The matter became a key election issue for the local government elections that occurred in late 2016. Farmer participants with whom the dam was specifically discussed all supported the dam and many expressed frustration that some of the regional councils elected members[32] were opposed to it. As a result of the 2016 local government elections (event 9 above), the composition of the Hawke's Bay Regional Council changed "profoundly" with two new councillors being elected, and the number of elected members who were critics of the dam increasing from four to five (of a total nine councillors) (Belford, 2016; V. White, 2017). The chairman of the council also changed from a 'pro-dam' councillor to an 'anti-dam' councillor (V. White, 2017). Also as a result of the election, fewer elected members had any practical experience of farming, and thus the council changed from being one dominated by farmer councillors; to one that was no longer dominated by farmer representatives which influenced the dynamics of decision-making on the council. Arguably as a result of the change in support around the council table for the dam, in November 2016 the Hawke's Bay Regional Council councillors ordered a review of the council's ongoing involvement in the RWSS (event 10). Ultimately the scheme did not proceed (event 12). On

[31] Decision was to 'decline' land swap, which made progression of RWSS very difficult.
[32] Council elected members are also sometimes referred to as councillors, and the terms are used interchangeably throughout the thesis, but for clarity it is noted refer to the same people – those elected to the regional council, not employed as staff by the organisation.

30 August 2017, after over five years and the investment of $NZ14 million, the regional councillors voted to invest no further capital in the RWSS (Hawke's Bay Regional Council, 2017a), in a decision described by Hawke's Bay Federated Farmers President Will Foley (a farmer in CHB) as "gut-wrenching" (V. White, 2017).

In amongst the controversy related to the RWSS, on 1 October 2015 the Tukituki Plan became operative. As outlined above, the decision on the Tukituki Plan was made by a central government appointed BOI which meant that decisions about management of freshwater in the Tukituki Catchment had been more separated from local resource users than if a council appointed hearing panel had decided upon the plan. Arguably, the process that the Tukituki Plan proceeded through was more reflective of a command-and-control approach to freshwater management than an attempt at collaborative freshwater governance. In any event, at the time the interviews were undertaken, Tukituki Catchment specific rules regulating land and water use did apply. However, they did not require any specific changes in farming practices until 1 June 2018. By that date all farmers were required to demonstrate accountability for all on- and off-farm effects of their operations through the preparation and implementation of a written farm plan, that had to include modelled results of the farm's predicted nutrient losses. At the time of the interviews (almost two years ahead of the regulatory deadline), four farmer participants noted that they had already had their farm plans prepared, or were in the process of having one prepared[33]. One farmer explains his general support of such plans because it might save him money:

If somebody can do me a nutrient plan that tells me I'm putting too much nitrogen on that maize then I'm more than happy, because the last thing I want to do is pour more on

[33] All participants that spoke of having a farm plan prepared had engaged a farm planning consultant to do it for them. There was also an option for farmers to attend workshops run by industry organisation Beef and Lamb New Zealand, and do a significant amount of the work on their plan themselves, but none of the participants had elected to do that.

there than I need to … I think there will be some positives come out of it, there'll be some things there that we'll learn out of that process that will help us farm (F16).

3.5.3 Change in public opinion towards farmers

Public questioning of farmers' practices is recognised by many as having been started by the "Dirty Dairying" campaign of the early 2000s that was initiated by Fish and Game (Holland, 2014). Fish and Game was an organisation originally established to represent fishers and hunters, but became active as an environmental advocacy group. The "Dirty Dairying" campaign saw the organisation voice their concerns about the decline of the ecological health of New Zealand's freshwater resources, which they argued had occurred particularly in areas that had high concentrations of dairy farms (Holland, 2014). The campaign grew in size and strength, and was supported by other environmental groups, as well as government agencies seeking the imposition of higher environmental standards (Holland, 2014). Ultimately the campaign even had an impact in catchments and regions like Hawke's Bay that had few dairy farmers. Many farmer participants spoke of their sense of a change in public opinion amongst the wider community about the appropriateness of some farming practices. Historically, the benefits that farming bought to the New Zealand economy had been regularly and publicly reinforced, and farmers had largely been left to go about their business as they saw fit and encouraged to focus on achieving increased productivity (Haggerty, Campbell, & Morris, 2009). Farmers had enjoyed a relatively privileged position in New Zealand society as a result of their role in feeding the nation and providing the "backbone" of the New Zealand economy (Hunt et al., 2013, p. 2). The high societal status that New Zealand farmers had historically enjoyed may have influenced the nature and magnitude of the response from New Zealand farmers to public criticism, as their actions had historically been almost unquestioningly assumed to be good for the country and consequently farmers had limited to no experience of public questioning and/or criticism. Small, Brown, and Munguia (2016) argued that the large amount of negative media attention

focused on agricultural impacts on water quality created social pressure on the agricultural sector to improve its environmental performance and reduce its negative impacts on water quality. The results of their research however, did not provide empirical evidence of a link between social pressure and changes in farmer practices. The advent and growth of the "Dirty Dairying" campaign did coincide with central government initiating new work programmes in relation to freshwater management, as outlined in Section 3.5.1 of this chapter. This alignment of timing possibly fuelled public debate, and vice versa. However, evidence to support this suggestion is elusive. During the central government election campaign of 2017 water quality was one of the key issues debated by political candidates and widely reported in the media (e.g. Hurley & Ewing, 2017). It is worth noting that this campaign was in full swing at the time the interviews with council participants in particular were conducted for this doctoral research.

In addition to the broader change in public opinion towards farmers, a number of farmer participants also spoke of critical comments made publicly by some regional councillors about the farming practices of some Tukituki farmers. It was evident that participants had taken councillors' comments personally, and several farmer participants who recounted the councillors' critical comments emphasized their dislike and disillusionment with some of the councillors elected at the time, with one describing them as *a bunch of dickheads (F10)*. Most farmer participants that did express critical views of regional councillors at the time made an effort to differentiate councillors from council staff with whom they stated they had not experienced any particular problems or frustrations. Public criticism of farming practices by regional councillors was not something that had occurred in Hawke's Bay previously. Farmer participants spoke of their offence at the comments, and the public nature of the comments arguably changed the dynamic of farmer-councillor relationships.

3.6 Conclusion

This chapter has illustrated the contrasting experiences of change of farmers' and the HBRC in the years preceding this doctoral research. For farmer participants, their experiences of transformational change in the farming sector in the decade or so preceding this doctoral research had been relatively limited. The Hawke's Bay Regional Council, and before it the Hawke's Bay Catchment Board, had worked alongside farmers in a partnership style manner to undertake soil conservation work. The council had historically adopted a relatively hands-off approach to the regulation of farming practices. Since the neoliberal reforms of the 1980s farming within the catchment had arguably remained relatively stable, with the proposition of the proposed RWSS representing what would have been the first significant, large scale contextual change in the catchment in several decades. In contrast, the freshwater governing context within which the regional council had been operating had been almost continuously changing. The organisation was being held more visibly accountable by both central government and the community. In endeavouring to demonstrate their own accountability, the council had set in place new regulations that would make farmers more visibly accountable for their farming practices. However, these had not taken effect at the time the interviews were undertaken for this research. The focus of this thesis now shifts to the design of this research, and the following chapter outlines how and why this research was undertaken.

Chapter 4. Research Design

4.1 Introduction

This research sought to provide insights into the individual lived experiences of farmers and people associated with the regional council involved in a contemporary transition towards sustainability. Given the focus of this research on the behaviour and interaction of people, a social science approach was employed. Social science research is the study of human groups and individuals, social systems, social institutions and social behaviour (Brooks, Schirmer, & Loxton, 2012). Brooks et al. (2012) argued that one of the fundamental purposes of social science research was to inform a better understanding of how individuals and groups behave and interact in particular situations, and the values and beliefs that underpin those responses to change. Specifically in relation to farmers, Thomas et al. (2020) argued that the growing body of social science research that sought to uncover the nature and complexity of farmers' knowledge was critical to support the move towards sustainable agricultural practice, and this doctoral research makes a contribution to this area of literature.

This research is considered to hold both intrinsic and instrumental value and sought to answer the following question - what is shaping the governing of farmers, and the impact of their practices on freshwater, in a rural catchment in New Zealand? Following this introduction, Section 4.2 outlines the research paradigm that defines and is evident throughout the research design, along with the rationale for a case study of inquiry (Section 4.3). The reasons for selecting the case are then set out in Section 4.4. Sections 4.5.1 to 4.5.4 provide a description of the data collection and analysis methods used and the strategies engaged to ensure the integrity of the research.

4.2 Research paradigm

This research is underlain by a constructivist approach that accepts that reality is socially constructed, and humans understand and make meaning of their experience, which is also influenced by broader society. The purpose of this research was to generate applied knowledge that could inform debate about agricultural policy, and more specifically discussion about the governing of farmers and the impact of their practices on freshwater. Through her employment at the Hawke's Bay Regional Council the researcher became critically aware of the lack of academic research that had explored at an individual level what practically shaped the governing of farmers in rural catchments in New Zealand. The researcher's desire to contribute to this area of knowledge led to the commencement of this doctoral research journey. This research is exploratory and will usefully inform freshwater governing approaches adopted and implemented in other regions across New Zealand.

4.3 Rationale for approach

The desire for this research to explore the lived experiences of individuals experiencing a transition meant that a qualitative approach was used. Such studies have the ability to reveal how people experience and think about events and social relations by seeking to "grasp actors' viewpoints for understanding interaction, process and social change" (Agee, 2009, p. 432). A qualitative approach provided the means to explore in what Agee (2009, p. 431) states as being the "microscopic detail" of the social and cultural aspects of individuals' lives, and facilitated what is argued by O'Leary (2014) to be the development of an intimate understanding of people, places, cultures and situations in a way that enabled intricacies and taken-for-granted aspects to be unpacked and made explicit.

A case study research strategy of enquiry provided the opportunity for in-depth explorations and thus the development of a rich understanding of the complexity of the case. Both Flyvbjerg (2006) and Yin (2014) argued that case study methodologies are particularly useful

for research that seeks to understand complex social phenomena. A case study research strategy was used because the management of freshwater was argued by scholars such as Pahl-Wostl (2017) (and confirmed through this doctoral research) to be complex, given the multitude of actors and processes involved. Yin (2014) argues that case studies allow a researcher to explore the social fabric of society through comprehensive description and analysis of a single situation or case while also retaining a holistic and real-world perspective. Similar arguments have also been made by other scholars (e.g. O'Leary, 2014). The ability to retain a holistic perspective when examining elements of the social fabric of the case study community aligned well with the systemic worldview held by the researcher.

Verschuren (2003) argued that one of the most common objections to case studies is their low generalisability because only one or two cases are studied. While it is accepted that some limitations to generalisability do apply in this case, it is also contended that the findings have applicability nationally, as all regional councils in New Zealand are grappling with the challenge of governing farmers and the impact of their practices on freshwater, and more broadly, active governing in the freshwater space. There are many catchments spread across the regions of New Zealand that are rural in nature and dominated by agriculture which is believed to be contributing to declines in water quality. While the nature and intensity of farming operations does vary, as does the unique history of each farming locality, and some local traditions and practices; some of the cultural context will be shared. The national level of the guiding freshwater regulations ensures a degree of consistency in governing approaches across the country. While catchment specific differences are allowed, ultimately the same freshwater objectives set out in the NPSFM2020 have to be achieved across the New Zealand. It was argued by Stake (1995) that the focus of case study research was particularization, not generalisation, and the approach therefore provides an opportunity to know well the case studied.

4.4 Case Study selection

O'Leary (2014) argued that there were two steps involved in case study selection. The first step was to define the case by setting the boundaries that gave it meaning and characterised it to the class of elements that were to be explored. The second step was to select a specific case (or series of cases) that met the definition and sat within the case boundaries. In other words, one must articulate the larger phenomenon that the case itself is an example of; and then the specific case and its boundaries. G. Thomas (2013) described the same concept by arguing that there are simply two essential parts to a case study – a subject, and an object. The subject is the case itself - a particular instance or entity that is the focus of investigation, while the object is the analytical frame that the subject in some way exemplifies and illuminates.

4.4.1 An example of the governing of farmers

The object of this case study was to explore what is shaping the governing of farmers and their freshwater management practices. Given the ongoing efforts by New Zealand's central and local government to achieve improvements in freshwater quality, that to date have achieved limited success (Ministry for the Environment and Stats New Zealand, 2020), an exploration of what is shaping the governing of farmers, and their freshwater management practices at the catchment level provided an opportunity to gain insights into how freshwater improvements could potentially be more effectively achieved.

4.4.2 Farmers and freshwater governing in the Tukituki Catchment, Hawke's Bay

The subject of this case study was the governing of farmers, and the impact of their practices on freshwater in the farming catchment of the Tukituki River, in southern Hawke's Bay. Farmers and people associated with the Hawke's Bay Regional Council (the local governing entity responsible for implementation of the NPSFM) were identified as being particularly

involved in freshwater management and the governing of farmers and were therefore selected to be the focus of this research strategy.

The case has intrinsic value because of its high relevance. As outlined in Chapter Three, the Tukituki Catchment was the first catchment in the Hawke's Bay region in which new regulations governing farmers were introduced by the regional council, so in the Hawke's Bay region, this was a novel experience for all actors involved. Changes to the regulatory frameworks that govern farming practices need to be made in every catchment of the Hawke's Bay region and are being developed and introduced over time. This means that this case study could potentially inform future catchment based freshwater governing approaches, both within the Hawke's Bay region, and in other regions across New Zealand. Approaches adopted by regional councils to the governing of farmers across the country have varied (as examined in Chapter Three), as have the magnitude of improvements in water quality they have (or have not) achieved. A more nuanced understanding of individuals' experiences of change could inform a more refined approach to the governing of farmers by regional councils across New Zealand, and arguably other NRM organisations that are responsible for the governing of farmers and the impact of their practices on freshwater.

While the inherent value of the case has been demonstrated above, practical and pragmatic considerations also informed the case selection process. The researcher lived and worked in the Hawke's Bay region and wanted to select a case within, or close to the region, because that enabled affordable, timely and ready physical access to the study location. As a consequence of her professional work experience, the researcher had established working relationships with a number of people within the regional council, other rural professionals, as well as some farmers living within the case study area. The opportunity to leverage off those existing relationships also favoured selection of a case within the Hawke' Bay region.

As part of the case selection process it was decided that it would be prudent to further refine the physical boundary of the case study area to enable any differences in individual

experience within the catchment to be identified and explored. As part of the Tukituki Plan Change process, the regional council had identified 17 sub-catchments within the wider catchment, as shown in **Figure 3.2**. It was decided that initiating snowball sampling (which is discussed further in Section 4.5.2.1) with farmers that lived within one of two sub-catchments[34] in which the catchment board/regional council had engaged with a higher number of landowners, but at different times, and in different contexts; provided a means of further refining the boundary of the case, while also providing an opportunity to explore if focused engagement by the regional council had any discernable impact on farmer-regional council relationships.

4.4.3 A single case approach

Case studies can explore one or more cases. A single case was selected because it enabled an in-depth exploration of what was shaping the governing of farmers in one farming catchment. The same opportunity to inform thinking and practice through a depth of analysis would not have been possible if multiple cases were studied.

4.5 Research methods

The methods employed as part of this research strategy are discussed in Section 4.5.1 below. Qualitative case studies can utilise a range of research methods, and multiple decisions were made by the researcher about the methods used. While justification for all decisions and choices made is not necessary, it is important to record decisions made by the researcher

[34] The sub-catchments were the Papanui and Makara Sub-catchments. The Papanui Sub-catchment contained about 130 farms, the majority of which ran sheep and beef (80.5%) (Lynch, 2013b). The sub-catchment was identified as a 'priority' sub-catchment for phosphorus loss in the Tukituki Plan. As a consequence, in late 2013, the regional council had established a catchment group that prepared a management strategy for the catchment (W. Hesketh, personal communication, October 23, 2015). Two farmers interviewed were members of the group. The Makara Sub-catchment covered an area of approximately 12,800 ha and contained about 60 farms, the majority (86 %) also being sheep and beef operations. As noted in Chapter 3, the Hawke's Bay Catchment Board constructed a flood detention scheme in the area, and worked with farmers to undertake soil conservation works on private property in an effort to reduce erosion. The fathers of at least two of the farmers interviewed had been involved with these works.

and the thinking behind these decisions because this facilitates, as far as is possible with qualitative research, the reproducibility of research.

4.5.1 Method choices

Benefits of utilising interviews as part of a research strategy were argued by O'Leary (2014) to include an opportunity for the researcher to develop rapport and trust with participants; a chance to gather rich, in-depth qualitative data – both verbal and non-verbal; while also offering sufficient flexibility to enable tangents to be explored, while still providing adequate structure to generate standardized, quantifiable data. Diefenbach (2009, p. 892) contended that interviews provided an opportunity to gather rich and diverse data that illustrated the existence of "multiple realities".

Semi-structured interviews were argued by Galletta (2013) to be a popular method of data collection for qualitative research because of the opportunity they offered to attend to the complexity of a story in need of contextualisation through their attention to the lived experience. Galletta (2013, p. 77) contended that the "give and take" of a semi-structured interview created space for researchers to probe participants' responses for clarification, meaning making and critical reflection. As previously noted, this research is applied and sought to explore the day-to-day lived experience of individuals experiencing a transition. A semi-structured interviewing approach was selected as the primary data collection method because of the flexibility it offered to explore and consider participants' experiences. The approach was found to allow discussion to flow as participants shared their stories.

The objective of the interviews was not to gain answers to set questions, but rather to explore and discuss the participants' recollections and thoughts relating to the governing of farmers and the impact of their practices on freshwater. Changes in farming practice for farmer participants, and in approaches to freshwater management with council participants, were focused on as a means of initiating discussion and encouraging storytelling by

participants. Stories were then probed and clarified to explore points raised that were particularly relevant to this research. The semi-structured style of interviews enabled that to occur. The interviews provided data that informed an understanding of what was shaping the governing of farmers and the impact of their practices on freshwater in the Tukituki Catchment. The value of the data was not in what individuals stated per se, but the nature of governing that was made evident through the discourse that was used and the stories that participants shared.

4.5.2 Case details

Twenty-four semi-structured interviews were completed as part of the main body of this research. All of these were transcribed and analysed. In addition, five scoping/preliminary interviews were undertaken in mid-2015 with key informants who lived and worked in the Tukituki Catchment. The purpose of the scoping interviews was to gather contextual information about the catchment and its community while simultaneously providing an opportunity for the researcher to develop her interview skills and techniques. Data collected in those interviews was not included in the results. Most interviews were approximately one hour in duration, with the longest taking just under two hours. All of the interviews were scheduled in advance, at a designated time and location.

The interviews were conducted in two stages. Interviews with farmer participants were conducted between August 2016 and February 2017, and the interviews with participants associated with the regional council undertaken between July and October 2017. Further details, including the date of each interview is shown in **Tables 4.1** and **4.2**. Interview guides were used to provide some consistency of structure across interviews. A different guide was developed for interviews with farmer participants and regional council participants. Examples of each interview guide are included in **Appendix 1**. Following Galletta (2013), the

opening questions were more open-ended and intended to elicit responses that drew on participants' lived experiences, before questions of a more specific nature were asked.

In addition to written notes taken during the interviews, a written reflection of each interview was made by the researcher as soon as possible after the interview was conducted. These reflections provided an opportunity to record additional contextual information about the interview, and a means of reflecting on the researchers interviewing technique, which was developed and refined as the interviews were undertaken.

All interviews were undertaken in person by the researcher. Every interview was digitally recorded and transcribed verbatim to ensure the integrity of the interview was retained as raw data for later interpretation and analysis. Some participants (eg. F16, RC21) did make comments about being quoted, or jokingly asking for the recorder to be switched off, before proceeding to make a specific comment. Such comments illustrated an awareness amongst some participants that they were being recorded. However, the researcher did not feel that the recording overly restricted the nature of discussion as opinions and views seemed to be shared in an open and honest manner by participants.

The researcher transcribed nine interviews. This process provided an opportunity to become intimately familiar with the detail of the interviews, as well as review and improve her interviewing technique. Fifteen interviews were transcribed by a professional transcriber. These transcripts were reviewed while listening to the recorded interview for accuracy and completeness. The transcription service turnaround times were fast and reliable therefore transcripts could be reviewed while the interviews were still fresh in the researcher's memory.

Preliminary thematic analysis of each interview was undertaken as the transcript for each was completed. A decision to not undertake any further interviews was made when no new themes were generated. Upon reflection, interviews with more regional council participants

may have been insightful; however, given the snapshot character and situational dependence of interviews (Diefenbach, 2009), and the period of time that had elapsed since the last interview was undertaken and this view was reached, it was not considered to be appropriate – particularly given the transitional nature of the case and its context.

The method of participant identification utilised varied between the two groups. The method of participant identification for each group is discussed in more detail below in Sections 4.5.2.1 and 4.5.2.2.

For farmer participants, multiple entry points were identified. As noted in Section 4.4.2, the first farmers approached lived in either the Papanui or Makara Sub-catchments of the Tukituki Catchment – two sub-catchments within which the regional council had been particularly active as the result of a catchment group in the Papanui that the council facilitated, and the Makara flood control scheme that the council had constructed and operated. A snowball sampling approach was then utilised, with participants being asked to suggest other farmers that held similar or divergent views.

For the regional council group, all participants engaged professionally with Tukituki Catchment farmers. The need for different approaches for each group was primarily a consequence of the researcher's employment at the regional council. She had established relationships with council staff, elected members and other rural professionals with whom the organisation engaged. The researcher also held organisational knowledge that meant she could identify possible participants.

4.5.2.1 Farmer interviews

As already noted, interviews with farmer participants occurred between August 2016 and February 2017. Sixteen farmers were interviewed. All but one farmer lived within the Tukituki Catchment, and all were still actively involved in farming. Most farmers were interviewed on their farms, around the kitchen table. This interviewing location was

obviously familiar to them, and potentially aided the free and frank nature of discussion. It also avoided the need for participants to travel and provided an opportunity for participants to access resources to aid discussion, such as farm maps. One difficulty of interviewing on-farm is that the interviewer did not have control over the conditions in which the interview was undertaken, which meant that in some cases there was significant background noise levels, which made transcription difficult. On three occasions, at the request of participants, walks/drives around the farm were also undertaken, before or after the interview, illustrating the symbolic value that the farmers perceived in what could be seen and shown to the interviewer on their farm.

Snowball[35], or chain, sampling was argued by Noy (2008, p. 329) to be a "data accessing" method that involved the researcher accessing participants through contact information provided by other participants. It is a widely employed method of sampling in qualitative research across many social science disciplines (Noy, 2008). One of its unique characteristics was argued by Noy (2008) to be that the researcher effectively relinquishes a considerable amount of control over the sampling phase. Noy (2008) argued that the relinquishment was a benefit of such sampling strategies because it meant that sampling followed the social networks of participants, rather than being influenced by the researcher's own social network. This approach was considered useful in this research because of the researcher's desire to explore the social networks of farmers, and also because it reduced the likelihood of the farmer sample being dominated by individuals that had more engagement with the regional council than the Tukituki farmer population more broadly. A potential drawback of such an approach is that participants social networks contain like-minded individuals, and therefore a diversity of opinions may not be captured in the sample. Given that this research

[35] The term 'snowball' is reflective of the somewhat repetitive nature of the process, where participants refer the researcher to other informants, who are contacted by the researcher, and then refer the researcher to yet other informants (Noy, 2008).

did not seek to provide a representative sample, but rather focused on exploring in-depth the lived experience of participants, a snowball sampling approach was considered appropriate. The researcher sought to access a diversity of views by specifically asking participants to suggest other farmers that held both similar, and divergent views.

The process utilised to invite participation was initially a phone call, in which the researcher introduced herself and her research and outlined what would be involved if the participant chose to become involved. An email was then sent to the prospective participant that included an information sheet with more details about the research. A copy of the information sheet is attached as **Appendix 2**. If the participant agreed to take part in the study, a convenient time was then arranged for the interview to be undertaken. During the interviews, before the recorder was started, participants were asked to sign a consent form, confirming their participation in the study, and understanding that the interview would be sound recorded. It is necessary to develop rapport with interview participants, particularly if there is no prior relationship with them. The researcher's experience growing up on and working on farms provided her with some knowledge that enabled her to demonstrate a level of respect and understanding of farming, and the lifestyle it involved, that enabled a rapport to be established with participants.

Only two farmers approached (one retired and one who had recently succeeded as manager of an inter-generational family farm) declined the invitation to participate, and they did this at the initial phone call stage. Summary details of the farmers interviewed as part of this research are provided in **Table 4.1**.

Table 4.1. Details of Farmer Interviews

Identifier	Date interviewed	Participant descriptor
F1	17 August 2016	Farm owner in Tukituki Catchment
F2	18 August 2016	Farm owner in Hawke's Bay (outside of the Tukituki Catchment)
F3	29 September 2016	Farm owner in Tukituki Catchment
F4	6 October 2016	Farm owner in Tukituki Catchment
F5	18 October 2016	Farm owner in Tukituki Catchment
F6	21 October 2016	Farm owner in Tukituki Catchment
F7	28 October 2016	Farm manager in Tukituki Catchment
F9	21 November 2016	Farm owner in Tukituki Catchment
F10	5 December 2016	Farm owner and rural professional within Tukituki Catchment
F11	8 December 2016	Farm owners (husband and wife interviewed) in Tukituki Catchment
F12	8 December 2016	Farm owner and rural professional in Tukituki Catchment
F13	19 December 2016	Farm owners (father and son) in Tukituki Catchment. Father retired but still helps on property.
F14	30 January 2017	Farm owner in Tukituki Catchment
F15	31 January 2017	Farm owners (husband and wife) in Tukituki Catchment
F16	14 February 2017	Farm owner and rural professional in Tukituki Catchment
F17	20 February 2017	Farm owner in Tukituki Catchment

4.5.2.2 Regional council interviews

Interviews with participants who were associated with the Hawke's Bay Regional Council were undertaken between July and October 2017, aside from one interview that was undertaken in November 2016. Eight people were interviewed, and the participants had or continued to work for the regional council in staff, management or governance roles, or were rural professionals that engaged with both farmers and the regional council through the course of their work. All participants engaged with farmers in the Tukituki Catchment in some way through their work. The interviews were undertaken either at the participant's place of work, in the participant's home, or two interviews, with whom there was a historic

relationship between the researcher and the participant, were undertaken at the home of the researcher. The researcher had established relationships with all council participants as a result of her employment at the council, which facilitated open discussion during interviews.

The same approach was utilised to invite council participants as was used for farmers – an initial phone call, followed up by an email, to which was attached the research information sheet, and then arrangement of a convenient time to meet. All council related people approached agreed to be interviewed. Summary details of each council participant are provided in **Table 4.2**.

Table 4.2. Details of HBRC Interviews

Identifier	Date interviewed	Participant descriptor
RC8	4 November 2016	Staff member at Hawke's Bay Catchment Board and HBRC
RC18	31 July 2017	Manager at HBRC
RC19	31 July 2017	Staff member at HBRC
RC20	1 August 2017	Manager at HBRC
RC21	1 August 2017	HBRC Councillor
RC22	14 August 2017	Manager at HBRC
RC23	28 August 2017	Rural professional who also farmed in Tukituki Catchment and was former staff member at HBRC
RC24	2 October 2017	Rural professional

4.5.3 Thematic analysis

Thematic analysis is a research strategy that Braun and Clarke (2006) argued can give a rich and detailed yet complex account of data. An inductive analysis approach was used to thematically analyse interview transcripts in this case that did not seek to fit the data to a pre-existing coding frame, but rather identified themes by repeated interrogation of the data as proposed by Braun and Clarke (2006). Because of this inductive method of analysis, the research question evolved during the coding process. Analysis was undertaken at the latent

level and sought to identify or examine underlying ideas, assumptions and conceptualisations.

Thematic analysis was undertaken manually. As each interview transcript was completed, the transcript was reviewed initially for accuracy (using the audio recording to compare against), and then read through several more times and coded manually to identify themes across the transcript. **Figure 4.1** provides an example of how this was done. Writing up the results demanded constant re-examination of the transcripts because the researcher wanted to use verbatim quotes as widely as possible to ensure this thesis was anchored in the voices and words of participants, given the focus of this research on examination of the lived experience of individuals. Corden and Sainsbury (2006) contended that the use of verbatim quotes helped to provide clear examples of links between data, interpretation and conclusions; and therefore contributed to the validity, reliability, credibility and auditability of applied social research.

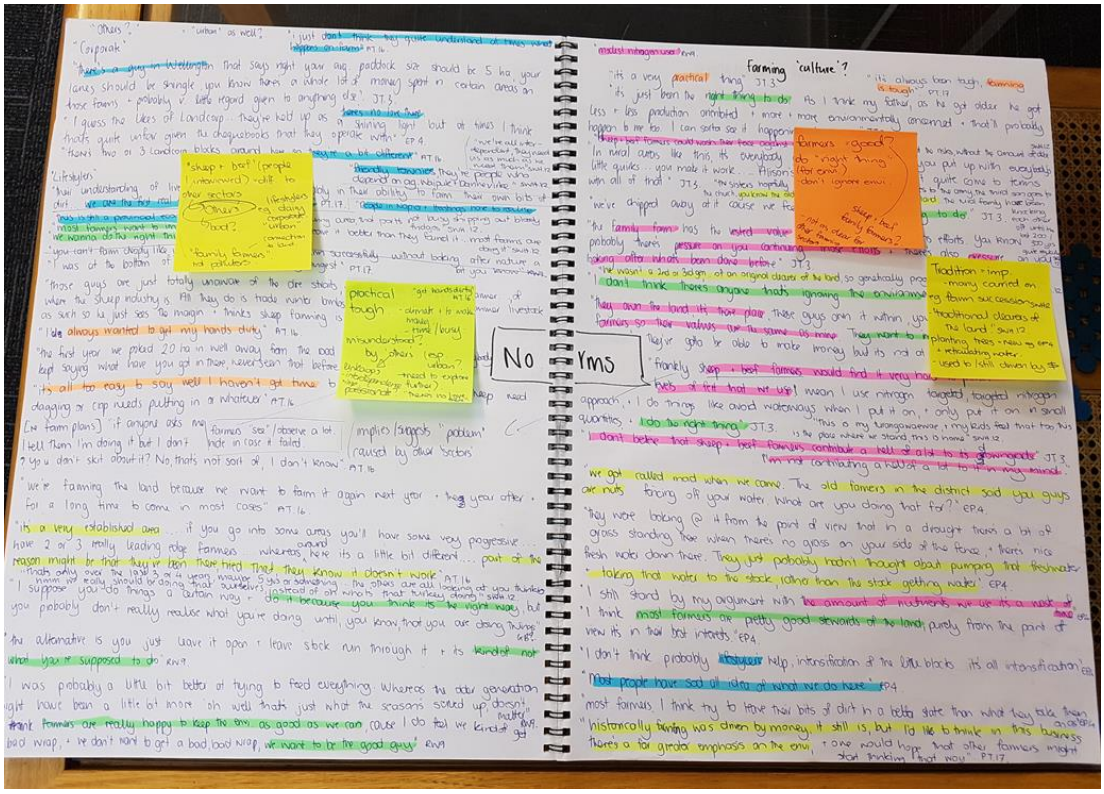

Figure 4.1. Manual thematic analysis in progress

Colour coding indicates data illustrating a particular theme and post-it notes provide high level summary of key themes generated.

Source: (Researcher photo, 2018).

4.5.4 Document analysis

Secondary data were sourced from documents. This data were primarily used to inform the case description. The types of documents that were drawn on for the research included central government policy documents and associated discussion and implementation documents, central government reviews, regional council policy documents, and other regional council reports such as state of environment reports and long-term plans.

4.6 Research integrity & ethical considerations

Diefenbach (2009, p. 889) argued that "there is no such thing like value-free or neutral social science", and it is therefore critical that case studies acknowledge whose reality they present. This can be achieved by researchers making explicit their own assumptions,

interests and philosophical and political perspectives. Galletta (2013, p. 12) argued that a researcher's reflection on their "autobiography" and its relationship to the case allowed them to explore how their own views and beliefs influenced their research. As already noted, the researcher has a worldview shaped by systemic and constructivist beliefs. The researcher's "autobiography" (Galletta, 2013, p. 12), as set out in Chapter One, Section 1.5, included growing up on a sheep farm and working for the Hawke's Bay Regional Council. These experiences arguably give the researcher a unique 'inside' experience of both farming and working for the regional council. Wegener (2014, p. 154) argued that an "insider researcher" was a researcher who had lived in familiarity with the group being researched, while the outsider was a researcher who did not have any intimate knowledge of the group being researched, prior to entry into the group as the researcher. The researcher's insider status arguably gave her background knowledge about the lived experiences of both farmers and regional council staff that aided discussion and gave her familiarity with the language and discourse used by both groups of participants. Insider status, however, also has the potential to colour a researcher's analysis, as they hold their own opinions and views about matters. The researcher's own lived experience of change (or absence of change) with the regional council had the potential to influence how she interpreted the data collected, and it should be acknowledged would have to some degree. A desire to ensure that this research was undertaken as objectively as possible was one of the reasons the researcher left the employment of the council during the time this doctoral research was being undertaken. Every effort was made to ensure that findings and conclusions presented in this thesis were grounded in data gathered, and the themes generated from that data.

Accepted norms for ethical conduct in research involving human participants were observed in this research, and the formal procedures required by Massey University's Human Ethics Committee were followed. The purpose of the research was discussed with each participant before informed consent was sought and given (see **Appendix 3** for a copy of the consent

form and **Appendix 2** for a copy of the information sheet). Confidentiality issues were highlighted because they were considered to be particularly relevant in this case due to the close knit nature of the rural community in which the research was undertaken. Although every effort has been taken to remove any identification information in quotes used and references made to participants, the confidentiality of participants could not be assured, and the recognition of some participants is possible. Particularly in a small country such as New Zealand, maintaining confidentiality of study participants is virtually impossible. Additional care has been taken in selecting direct quotes for use in this thesis, and use of quotes that could be considered contentious has been avoided. During several interviews participants explicity asked that some comments or opinions were not shared more widely, and such requests have been respected. Participants all appeared to speak freely and frankly, sharing their thoughts and opinions willingly. Given the existence of a relationship between the researcher and council participants prior to the interviews, the honest nature of discussion was not entirely unexpected. However, the candid nature of discussions with the farming participants was somewhat unexpected, but much appreciated.

4.7 Conclusion

This research comprises a single qualitative case study in which semi-structured interviews and thematic analysis were the primary research methods. This research design was considered to be the most practical and appropriate means of gaining insights to the lived experiences of farmers and people associated with the regional council who were experiencing a contemporary transition that had impacts on both the governing of farmers and freshwater in New Zealand.

Chapter 5. Results

5.1 Introduction

In-depth, qualitative methods were used to uncover what is shaping the governing of farmers, and the impact of their practices on freshwater. This chapter presents results from 24 semi-structured interviews, consistent with the methods described earlier that were the primary research method used in this research, as outlined in Chapter Four. This chapter begins with an exploration of the results in relation to farmers (Section 5.2), and then moves into sections that focus on the results related to the regional council (Sections 5.3.1 to 5.3.4). Results that illustrate the nature of the relationship between farmers and the regional council are then explored (Section 5.4) before the chapter is concluded with a summary of the institutional logics and sticking points that emerged (Section 5.5). As discussed in Chapter Two, the theoretical concepts of institutional logics and sticking points have been drawn on to help gain deep insights into the results of this research. These are discussed in further detail in the penultimate Discussion Chapter (Chapter Six) of this thesis. As also noted in Chapter Two, anywhere throughout the thesis where verbatim data quotes have been used they are indicated by the use of italics. *F* identifies a farmer participant, and *RC* a regional council participant.

5.2 Farmer change evident but not a result of active governing

Interviews with farmer participants focused primarily on exploring changes in on-farm practice that participants had made, and the reasons why they had made those changes. How those processes of change had unfolded was also explored. Sections 5.2.1 and 5.2.3 explore what did emerge as shaping the governing of farmers' freshwater management (in the absence of evidence of active governing by the Hawke's Bay Regional Council). Section 5.2.2 explores the nature of changes made and Sections 5.2.4 to 5.2.6 detail factors that emerged as shaping those processes of change. **Table 5.1** provides some demographic

information about each of the farmer participants that illustrates the range of farmer participants interviewed.

Table 5.1. Farmer participants demographic information

Participant	Gender	Age*	Type of farm	Size of farm**	Family Farm?
F1	Male	40-50	Sheep and beef	Large	Yes, 4th generation
F2	Male	55-65	Sheep and beef	Large	Yes, at least 2nd generation
F3	Male	45-55	Sheep and beef	Small	Yes, 3rd generation
F4	Male	40-50	Sheep, beef and deer	Medium	No
F5	Male	45-55	Sheep and beef	Medium	Yes, 2nd generation
F6	Male	55-65	Beef	Small	No
F7	Male	45-55	Sheep and beef	Large	No
F9	Male	40-50	Sheep and beef	Large	Yes, 2nd generation
F10	Male	45-55	Sheep, beef and deer	Small	Yes, 2nd generation
F11	Male & female	55-65	Sheep and beef	Small	No
F12	Male	50-60	Sheep and beef	Small	Yes, 2nd generation
F13	Males (2)	35-45 & 60-70	Sheep, beef and cropping	Medium	Yes, 2nd & 3rd generation
F14	Male	40-50	Sheep, beef and cropping	Small	Yes, at least 2nd generation
F15	Male & female	50-60	Sheep and beef	Small	No
F16	Male	45-55	Sheep, beef and cropping	Small	No
F17	Male	50-60	Sheep, beef and cropping	Large	Yes, 4th generation

* Participants age was not asked in the interviews and has been estimated within a 10 year age band.

** The size of farm was classified as being within one of three categories: Small (0-500ha), Medium (500-1000ha), Large (1000ha+).

5.2.1 Public opinion shaped farmers' practices

In this case, public debate about the sustainability of some farming practices emerged as having shaped farmer participants' freshwater management behaviour. Public questioning appeared to have challenged farmer participants' self-identities as good farmers – illustrated by farmer participants' observations of a change in attitude towards farmers, and a growing divide between urban and rural. The comments of Farmer 2 encapsulated well the change in societal views about farming practices farmers felt had occurred:

> *If you just go back to my father's generation…so 35 years ago our farming communities were being incentivised by the government and by the people of New Zealand to clear our hillsides [of trees], to pour on fertilizer, to boost our stock, because our country was bankrupt in 1984. So we had the livestock development loan, we had the incentive scheme and we had fertiliser subsidises. So all of society were saying to farmers go forth and cut trees down, create pasture, and grow things. Which we did - 70 million sheep and at the time was thought to be the thing to do…one generation later, it's completely the opposite* (F2).

As set out in Chapter Three, public debate about some farming practices had initially focused on dairy farming areas[36] where declining water quality had been observed. However, over time criticism was more broadly targeted at the farming industry, and that highly visible critique of farming practices that evidently resulted in farmer participants questioning their own identities as good farmers. Farmer participants spoke of their *want to be the good guy* (F9). Other participants felt that the broader community had changed and considered farmers to be bad or evil, as illustrated by the comments of these participants:

[36] In 2017, around 4% of the land in the Tukituki Catchment used for farming and forestry was used for dairy farming (Board of Inquiry (BOI) into the Tukituki Catchment Proposal, 2014). The Hawke's Bay region, as a consequence of its hot, dry climate, and relatively limited access to water for irrigation; is not considered to be particularly well suited to dairy farming, thus dairy farm numbers in the region are relatively low compared with other regions across the country.

Everyone thinks we're evil. Everyone thinks that cows are evil, and its kind-of you know, we don't even wanna eat meat (F9).

Our little local [rural] school went to an Enviroschools production put on by one of the urban towns here, it was at the municipal theatre, and there was a whole section about how evil dairy farming was (RC23).

A number of participants (both farmer and regional council participants) commented on what they considered to be a reduction in contact between farmers and 'others'. This was described by some participants as the growth of an urban/rural divide. For example:

I think the divide is getting bigger. There is a disconnect. I would totally agree with that. Most people probably have sod all idea of what we [farmers] do here (F4).

With reference to urban people:

Don't know a farmer, don't personally know a farmer…they just don't know them (RC23).

If you go back a generation ago, two generations ago, there was probably everyone in town knew someone on a farm. That's not there anymore so direct contact's not there (RC24).

Farmer participants indicated that they believed a lack of understanding about the practicalities of farming was one of the causes of the growing number of voices that were challenging the industry's sustainability. Farmer participants evidently felt misunderstood and isolated and frustrated at what they felt was *a perception out there that urban has a right to tell rural what to do (F4).* The mainstream media was perceived by both farmer and regional council participants to have played a role in the growth of anti-farming rhetoric. For example:

Farmers get a pretty bad rap for water quality of the river…I would like to think that the [poor farmer practice] examples we constantly get blasted with by the media are a minority and an exception to the rule (F4).

Fifty percent of the farms we go on are amazing, but no one wants to know about them, they want to know about the bad ones…it's going to be hard to get it across to the mainstream [media] because in their eyes every farmer is a polluter now I think (RC23).

Look at this last election and the rhetoric, unsubstantiated rhetoric that was going around…every farmer in New Zealand must have felt like they were completely screwing the planet (RC24).

Participants felt that media coverage was unhelpful in two ways – because it focused on the few *bad eggs (F12)* in the farming industry, and because *wombles that don't have a clue (F10)* had written stories that seemed to have an unnecessarily negative slant. What was reported in the media was important to farmer participants because that was how their farming activities were made visible to others, and the importance of accurate media coverage assumed an additional level of significance when many media receivers had no direct contact with farmers or farming themselves. The public nature of the questioning of farming practices was a new experience for farmers in the Tukituki Catchment, including the sheep and beef farming participants of this research and had led participants to reexamine their identities as farmers.

5.2.2 Raft of changes made to on-farm practices

Farmer participants had (and continued to) make a multitude of changes to their farming operations, with every participant detailing at least one substantive change they had made to their farming practices. Almost all participants articulated the reason for changing their farming practices as being a need to adapt to the changing climate. Increasing the flexibility and adaptability of their farming systems enabled farmer participants to adapt during

extended periods of dry weather that participants were more regularly experiencing. Three farmers share the changes they have made:

We […] cut those breeding numbers back, and we run a reasonably big lamb trading element, and a reasonably big heifer trading element. What it does is it basically gives us room to move when the seasons get tight, and we can sell stuff or buy stuff if we have to (F9).

I dropped the numbers [of livestock] quite a bit in one hit [during a drought], and then trying to build them up is quite an expensive little thing so I thought oh well maybe I might be better off having less sheep and more bulls, just to make it more flexible really (F14).

April to November was 90 percent of our production in this business, but that is getting squeezed or historically our opportunity to farm is getting less so we have to factor that in as to how we farm. So hence our thinking around shortening up our summers, less stock over the summer (F17).

Drought farming experiences had enabled participants to gather experiential knowledge about farming through dry periods, and multiple droughts had provided farmers with opportunities to learn and adapt their farming operations further. These farmers describe how their experience farming through several droughts had helped them develop a strategy that enabled their farming business to survive droughts:

We've fed [livestock for] many years in droughts and you do all the work and still [it is] worth no more money. You get your money back but you don't get paid for your labour so we just decided that this year we weren't going to feed, and so we sold them all. We haven't regretted it since (F4).

The first drought that hit me was about two years after I started farming and you just went into shock. I guess that's the other good thing about having been through a few, you know the last couple of droughts I've been through…we used to have a plan like on the 1

December we got rid of all the lambs, and the 1 January got rid of 1/2 the hoggets, instead of just sitting there and hoping it's going to rain again (F6).

Although articulated by farmer participants to be changes that increased the flexibility and adaptability of their farming operations, the underlying driver of many practice changes was arguably driven by participants' need to ensure the ongoing financial viability of their farming businesses. Ensuring the financial viability of their farming businesses was linked with farmer participants' productivist identities, which in this case emerged as being linked to livestock, land, and a financially productive farming businesses. This is outlined further Section 5.2.3.

5.2.3 Farmers' productivist identities: a shaping influence

Farmer participants' productivist identities emerged as shaping how they responded to societal calls for change in on-farm practices. The self-identity of farmer participants in this case was evidently linked to their livestock and land, as well as the financial status of their farming business.

5.2.3.1 Livestock management as part of farmer identity

Being a good stockman, and particularly providing good quality drinking water and sufficient shade for stock, was one of the key constituents of a good farmer that emerged in this case, and had driven changes in the on-farm practices of farmer participants. The provision of good stock drinking water was described by one participant simply as one of the *basics of good stockmanship (F6).* A number of farmer participants (eg. Farmer 6, Farmer 11, Farmer 17) had installed reticulated stock drinking water[37], in some cases over an extended period of time due to the capital investment and time that such work involved. A move to reticulated stock water supplies also illustrated a change in good farming norms as drawing

[37] Although a less common practice now, historically many farmers relied on streams to provide drinking water for stock. The alternative to relying on a natural water supply is to install reticulated water, which, while providing a higher quality and more reliable water supply, also requires considerable capital investment.

water from natural sources was no longer considered good practice. The main reason given by participants for moving to reticulated supplies was articulated as being for stock health reasons, although a small number (eg. Farmers 4 and 14) did acknowledge that it would also have benefits for water quality as *they're not standing in the water are they… mucking it up (F14)*, as well as being helpful for stock and workload management.

Providing sufficient shade for stock was also identified as being an attribute of a good stockman. Planting trees was spoken of by a number of farmer participants in terms of their role in providing shade for stock. For example:

You know people are doing all sorts of stuff […] more trees to break wind, and wind flow, and that shade and shelter thing (F5).

The basics, and basics [of stockmanship] to me are super [fertiliser], shade, shifting… shift the sheep, shade, shelter, good water, feed the hell out of them (F6).

So it was easier to put a fence across there and plant trees in there, it was part of creating shelter or shade as well for the stock (F12).

This farmer explains how farmers' awareness of the need to provide shelter for stock has changed:

I think farmers understand animal welfare and understand that stock stress, heat stressed or something, you occasionally see it now but a lot less than you would have 30 years ago, really hot summer days and sheep standing with their heads in the shade of a baton or a post as their shade relief. That's pretty rare, that's a lot rarer than it might have been 30 or 40 or 50 years ago (F12).

These examples illustrate that farmer participants considered tree planting to be an activity related to good stockmanship, rather than an activity that could be beneficial for water

quality, thereby illustrating the central role that livestock rather than water constituted in the construction of their identities as farmers.

5.2.3.2 Land central to farmer identity and activity

Farmer participant descriptions of the *use (F3)* of land demonstrated an ongoing role of productivist norms in shaping farmer participants behaviour and an ongoing focus on land and land-based practices. Farmer participants spoke of farmers as working on/with land, rather than people that undertook activities that potentially impacted water quality, or farmed water. In describing farmers in general, farmer participants related it to land:

I think most farmers are pretty good stewards of their land (F4).

Most farmers want to improve their land, they want to leave it better than they found it (F12).

Notions of a need for farmers to sustain and improve their land were expressed by several farmer participants – some of whom explicitly linked the need to care for land to a farmer's ongoing ability to earn an income off it:

*I think most farmers are pretty good stewards of their land, purely from the point of view that it's in their best interest. If you've paid a fairly sizeable chunk of coin to own this bit of dirt if you for want of a better word f*ck it, it's you that directly is affected in the pocket (F4).*

Farmer participants specific references to stewardship illustrate an awareness of their role as stewards of the land, and responsibility to carefully manage the land resources of their farms. Another farmer explains why it is important for farmers to care for their farms:

If you don't look after your asset, it won't look after you, so you kind-of have to treat it well and not screw it, and put a bit back into it, and it will look after you (F9).

Another farmer explains that it is in a farmer's best interests to ensure that land is well looked after and able to be farmed for many years:

Farmers are not idiots, and most of them have developed something that works for them and works on their property. I mean we're farming the land because we want to farm it again next year and the year after and for a long time to come in most cases. So we're treating it as a long-term investment and we've got a lot of money tied up in it (F16).

A farmer's ability, and arguably responsibility, to improve the quality of their land contrasted with views expressed by some farmer participants about their inability to influence the quality of surface water that flowed through their properties. A farmer explains:

Most of it flows from one end of my property straight through to the other in the creek. There's nothing I can do about that (F3).

Another likewise outlines why he cannot influence the level of silt in the water:

So up here we've got so much water that comes from underground anyway. Like springs to the little creek, to the big creek to so when it rains most of that silt comes from underground. Tomos and all that sort-of stuff. So really for me the silting process has been, is a natural thing (F9).

These farmers explain that the state of the water was changeable:

I noticed you get flushes coming through now so it's pretty up and down and gone sort of thing (F14).

At this time of the year the water looks beautiful, but get a flood through it and it runs thick with silt … I wouldn't have noticed a difference in water quality because it runs anywhere from completely clear to get a handful of it and almost watch it settle in your hand (F16).

Evidence of farmer participants considering there to be a link between their farming practices and water quality was essentially absent in this case.

5.2.3.3 You've got to be black to be green

It was clearly illustrated that running financially viable businesses was important to farmer participants. The financial position of a farming operation was recognised by several farmer participants as having a direct influence on their ability to make on-farm practice changes. Works that would result in water quality improvements (i.e. planting trees, fencing out waterways) often required capital investment that took time to accumulate, meaning that some farmer participants could only make incremental changes over an extended period of time. These farmers explain how the amount of money they made influenced how much environmental work they could do:

If you've got a bit more dough, you can do some stuff. You can fence some waterways, you can do some fancy soil tests, or do whatever - plant trees (F1).

You have to be black to be green… we've chipped away at it cause we feel like it's the right thing to do and because we've been able to afford those little bits, and allow the time (F3).

The more money we have, the more options you have, or the larger area you can do or there's a different extent you can do it… so yeah, the amount we do each year depends on how much we make I suppose, yes (F4).

However, financial viability of a farming operation did not emerge as being the primary driver of on-farm change (or not). A number of farmer participants had continued to farm sheep, despite their acknowledgement that financial returns did not in themselves justify it – illustrating that continuing to be sheep farmers was important to these participants. These farmers explain that farming sheep was not financially rewarding:

The economics in farming just wasn't there, particularly sheep farming - that had become a very difficult environment to stick in (F3).

My little rule in my head is that I've just turned 45, when I'm 50 if the sheep jobs still shitty I'm binning them. That's me, I'm out, I've given it a decent go. I've given it 25 years and it still didn't come right so stuff it (F9).

This farmer explains that, although it was difficult to justify continuing to farm sheep, he was reluctant to stop doing it:

I've been a livestock farmer all my life and quite happy to do that, but if you think growing crops is fraught with challenges then the livestock industry is really grappling with sustainable or survivability at the moment; the sheep industry's appalling (F17).

5.2.3.4 Farming – not just livestock, land and production

A number of farmer participants spoke of other activities that they undertook on their farms that they took pride in. These were not directly related to production, such as fencing off native bush. These farmers describe their tree planting efforts:

The other habit we have is we plant natives too. So we fence off corners or we're just gonna plant a shelter belt in the next day or two, cabbage trees and flaxes and that sort of thing (F4).

We've been plodding on as best we can … I think we're up to about 105,000 trees/plants been planted since 2008 so it's been transformational (F5).

This farmer explains that he thinks his appreciation of other aspects of farming (besides production) has developed as he has got older:

As I think my father, as he got older he got less and less production orientated and more and more environmentally concerned and that'll probably happen with me too. I can

sorta see it happening already where I don't really give a monkeys about some things, but I like seeing the pigeons in the trees (F3).

Due to their parents' interests, these farmers explain that they have always had an interest in environmental matters:

[I was] bought up in the environmental tree hugging space. Been a member of Forest & Bird and all those sorts of things. I've been always quite interested in environmental aspects of things, not that I've taken it to the enth degree but in terms of respecting it or trying to do something about it (F10).

I spent most of a lot of my childhood being forced to water trees. I tell you that anecdote because it gave me an appreciation of trees and the benefits of trees …so I guess through my childhood and teenage years I watched the trees make a better environment so it was just instilled into me so I continued to plant trees (F12).

5.2.3.5 Community involvement important

Participating in the broader rural community was noted by a number of farmer participants as being a characteristic of a good farmer, reflected in descriptions of other farmers such as *a good community man (F16)*. Many of the farmer participants were involved in the community through membership/participation in various community groups such as fire brigades, the A&P[38] association, sports clubs, school committees and catchment schemes. This farmer explains how he and his wife were involved in the local community:

[38] An A&P association is an agricultural and pastoral association, which were associations originally set up to promote farming pursuits, that generally focused on running annual farming shows. The idea came from Britain, and the first show held in Hawke's Bay was in Havelock North in 1862. In the 1950s over 100 shows were held across New Zealand including in Central Hawke's Bay ("Te Ara - The Encyclopedia of New Zealand," 2021).

Yeah [participant's wife] is on the PAFs [Parents and Friends School Committee] and I'm on the Board of Trustees so that's yip a big thing. I'm president of the local sports club and umm, so yeah, community is very important (F5).

Another farmer identified the local school, fire brigade and local hall as being important components of the local community that he described as being *a really tight community* (Farmer 16). The importance of the practical support that communities provided for each other in rural areas is highlighted by another participant:

In rural areas like this […] you make it work […]- you look after everybody and you know, muck in (F3).

Phrases such as *mucking in (F3)* suggested a sense of common interest and need to support each other, particularly during difficult times, such as farming through extreme events such as floods or droughts. During such times the emotional/moral support that farmers provided each other was recognised by farmer participants as being critically important. These farmers explain how important that support was in helping them to farm through their first droughts:

A really good group of people, and […] they were all quite open...yeah it was good […] without that I would have, I don't know what would've happened, it was just really useful (F5).

[I was] really in the shit like the first time, you know you just keep clinging on, clinging on, and everything just turned totally to custard… I had a whole lot of neighbours, a really good bunch of mentors, you'd call them mentors now, but basically I'd just go and drink beer with someone every couple of days (F6).

Regular contact with other farmers was also highlighted by farmer participants as providing an opportunity to share information and local news, and in some cases get advice that could inform the day-to-day management decisions that farmers were constantly making. This

farmer explains that regular contact helped him to know whether other people were having the same problems that he was:

We talk about what's going on probably twice a week or more. You know - are you having this problem, and have you seen this? (F3).

This farmer describes the type of things he liked to discuss with other farmers:

You've got a bunch of people you can ring and say are you buying cattle at the moment? Do you think they're too expensive? (F12).

Contact was sometimes made for other reasons, as this farmer explains, but provided an opportunity to catch up as well:

Neighbours you might ring up for whatever reason, bull's jumped over the fence or something like that. So yeah, just have a bit of a chat and a catch up and see what's going on (F14).

A number of farmer participants identified other activities that they engaged in which provided them with an opportunity to leave the farm and talk with other farmers and share experiences. The local pub is mentioned by one participant as being an important location for networking and sharing experiences:

You can go down there on a Friday night, 5:30, 6 o'clock, we only go for a couple of hours but you might find 10 or a dozen other farmers that are down there, compare notes for the week (F16).

Membership of the local Lions Club provided another farmer with a regular opportunity to catch up with other farmers to *talk, see what's going on and all find out all the goss (F14).*

5.2.4 Changes implemented influenced by localised farming norms

While all farmer participants had changed some on-farm practices, the actual changes made appeared to be shaped by local farming norms. One farmer participant's recollection of how

they went about trialing a new crop illustrates the highly visible nature of the assessment process that allowed farmers to judge the skills of others and their status (or not) as farmer. It also illustrates a cautious approach to change and farmers' desire to check that a change would work before committing to it on a large scale. He explains:

Nobody had grown maize here before...so the first year we poked 20 hectares in well away from the road so nobody could see it. Everyone kept saying what have you got in there, never seen that before (F16).

The importance of planting the trial crop *so nobody could see it (F16)* illustrated the farmer's reluctance to trial something new and fail in view of other farmers. Another farmer participant describes the stepwise approach he had taken when he had reconfigured his farming operation to focus on rearing calves rather than breeding cows:

When I first converted, in my head I had well if it doesn't work I don't wanna put anything in that costs money that's gonna commit us. So we made the sheds very basic. We had netting instead of panels. We had buckets we filled from the hose for the water. We did everything so that if it didn't work out we can pull it out and ignore it (F3).

This farmer describes how he felt comfortable making a large scale change after visiting a property that used plantain and clover[39]. After seeing the results in-person the participant was willing to adopt the new practice at a large scale on his farm almost immediately:

This guy was one of these first guys into plantain and clover […]so we'd looked at this and it was all helicopter sown, and it was just full on the production he was getting and all that so literally I just came straight home and did it exactly […] it was awesome. We've put 85 ha of the stuff in, and it just revolutionised the place - full on... so when you see that working up there, I just went yip, done (F9).

[39] Plantain and clover are alternative forage species used by some sheep and beef farmers in New Zealand because they produce more dry matter and have higher nutritional value over the drier months of summer and autumn (Cranston, Kenyon, Mosrris, & Kemp, 2015)

Another farmer participant recalled that *we got called mad when we came. The old farmers in the district said you are nuts fencing off your water (F4).* This farmer participant had purchased and moved onto a farm at the end of a relatively isolated gravel road, next door to farmers that had been *doing it [farming] for a while (F4)* suggesting they were older, experienced farmers. Despite knowing that his neighbours didn't agree with what he was doing, the participant went ahead and installed a reticulated water system and fenced out a large gorge that ran through the property. In this instance, localised farming norms had not stopped the farmer making a significant change to the way the farm was operated. However, his comments and awareness of what his neighbours thought about what he had done demonstrated an influence of local farming norms.

Tree planting practices were also identified by farmer participants as having changed over time. Historically tree planting had not been recognised as part of local good farming norms, in fact the opposite activity of cutting down trees had been recognised as the practice of a good, hard working farmer, who was clearing land and enabling it to be used productively. Farmer 1 described the evolution of this farming norm well:

> *My father was in those days the best farmer in the district […] the farmer that chopped down the most trees, had the biggest burn off and developed the most pasture. He was given all the prizes and the accolades cause that was the best farmer. One generation later, it's completely the opposite (F1).*

Notwithstanding the changes in tree planting norms observed, several farmer participants (eg. Farmers 3 and 6) had been planting trees, or specifically poplar poles[40], for an extended period of time - continuing a practice that had been started by their fathers. The catchment

[40] Poplar poles are young tree stems between 1 and 3.5m long which root and sprout when planted in the ground. Poles have a head start over seedlings and are less likely to be damaged by grazing animals (Horizons Regional Council, n.d.).

board/regional council pole schemes[41] had initially only operated in catchments in which flood control schemes were constructed. As outlined in Chapter 2, the Tukituki Flood Control Scheme was the first constructed by the Hawke's Bay Catchment Board, and therefore landowners within the catchment were amongst the first in the region to have access to subsidised poles. As noted above, the motivation farmer participants referred to when speaking about planting trees was to provide shade for livestock, rather than the range of benefits that can be realised as a result of tree planting.

5.2.5 Relationship between farmers and council

The longevity of the pole planting scheme in the Tukituki Catchment had evidently embedded a partnership type relationship between farmers and the regional council. Soil conservation work was done in a collaborative manner where the catchment board/regional council worked alongside farmers for what was described as *a common purpose, a common goal (RC8)*, and farmers did not have someone arrive and say *you must do this (RC8)*. Catchment board/council staff invested significant time and energy in developing relationships with those farmers on whose properties soil conservation works were needed, which in additional to soil conservation work was done by *giving cockies a hand docking*[42] *(RC8)*. Although a number of farmers (eg. Farmer 3, 4, 10 and 11) specifically named land management staff from the council (current and former), which illustrated the establishment of direct relationships between farmers and council land management staff, comments about *office jobs (F4)*, although in jest, suggested that land management staff spent less time practically working alongside farmers on their properties than they used to.

[41] The 'pole scheme' was initially a catchment board scheme, which was then continued by the regional council that sold poles to farmers (from the regional council) at cost price.

[42] Docking is the term used in the North Island of New Zealand to describe the removal of a lamb's tail. Lambs are docked to prevent dags (wool matted with dung) building up around a sheep's bottom, which can lead to animal health issues for sheep such as fly strike. In the South Island of New Zealand, this practice is referred to as tailing (New Plymouth District Vet Group, 2021).

The *common goal (RC8)* referred to above warrants further discussion as the goal spoken of was soil conservation - it was not the improvement of water quality as illustrated by these farmer participants' comments:

I'm mindful of water quality but it's not something that makes me go and plant the poles. What makes me go and plant the poles is keeping the land on the land so that I can use it (F3).

That [water quality] wasn't the main aim [of planting trees], it was to keep the soils on the hill so that they remain productive (F12).

What was illustrated in this case was that farmers' productivist identities associated with livestock and land shaped their on-farm practices. Water did not appear to constitute part of farmer participants' productivist identities.

5.2.6 Farmers' ways-of-knowing inform practice change

Another factor that emerged as shaping farmers' freshwater management were their ways-of-knowing. Farmer participants' ways-of-knowing emerged as being informed by lived experience (both their own and others), advice from trusted others, and a whole farm approach to decision-making that required a range of factors and influences to be balanced.

5.2.6.1 Lived experience highly valued

Experiential knowledge emerged as being highly valued by farmer participants. All farmer participants had lived on farms as children and had been actively farming for at least seven years. The development of their experiential knowledge started as children/teenagers when they learnt basic farming skills, as several participants explain:

Being brought up on a farm I knew basically what a good animal looked like, and what a bad animal looked like (F3).

Brought up on a farm you sort of learn most of the ropes […] The basics I learnt from my father - really good stockman, and shifted the sheep everyday, didn't go for too much flash stuff (F6).

I was sorta practical because I'd grown up on a farm, you know I could lamb a sheep and use a hand piece (F12).

One farmer participant who had spent many years working in a city before returning to take over the family farm explains how his lack of practical experience as a stockman had caused him to delay (for a couple of years) changing the farm's primary focus from being a breeding operation to a trading enterprise:

We didn't really adjust for probably a couple of years because given our backgrounds we weren't really…well I wasn't a stockman per se, I was more of a figures person, and you know… over time I've become a stockperson but […] but to go to a salesyard and make those key decisions on trading livestock ...I didn't really have that (F3).

Farmer participants appeared able to separate the effects of their on-farm practices on local water quality because a visible decline in water quality was not their lived experience. When questioned about their perceptions or observations of water quality within the Tukituki Catchment, farmer participants either stated that they had not personally observed a deterioration in its quality, or that they had not taken particular notice and did not want to provide a view on the matter (e.g. Farmers 12 and 16). The visual observations of these farmer participants informed their views that water quality had not declined:

Our streams that run through our farms …nah haven't noticed any difference (F1).

I'm a little bit of [a] keen fisherman now and....well, I dabble in it a little and so I've noticed that the algal influence and the greening up of the river but I don't think it's getting any worse (F3).

I took my kids down the Tuki [Tukituki River] for a swim over summer and that was the first time I've been down there for I couldn't remember when actually […] It was beautiful. It was warm and clean and really nice (RC23).

In contrast, a number of farmers spoke of their belief, informed by personal experience, that there was a problem with water quantity within the Tukituki Catchment:

Over here there's a dam that I used to duck shoot with Dad every year. Full on with water, full on with ducks, well that hasn't had water in it for at least 6 or 7 years […] So I don't know what's happened there (F9).

Quantity - around the 2000s, late '90s and that this front creek actually stopped flowing […] my father said the only time he'd ever remembered it stopping was when someone dammed it further upstream (F14).

This farmer explains that a stream on his property flowed for fewer months of the year now:

Used to flow other than sorta January, February but now it's July to September (F17).

These comments highlighted the contrast in the lived experience of farmer participants with issues related to water quality and quantity and illustrated the way that farmer participants' personal experiences shaped their beliefs about what was, or was not, occurring in their catchment.

5.2.6.2 Advice of trusted others

Farmer participants also relied heavily on the experiential knowledge of trusted others in making decisions about on-farm practice changes. Some farmers (e.g. Farmers 6 and 9) spoke of their fathers as being one of their key sources of knowledge about farming, and the father and son interviewed together illustrated the ongoing strength of family ties. Other farmers also included neighbours and friends whose advice farmer participants trusted

because it was informed by practical, shared or similar experiences. These farmers explain why they valued advice from people with practical experience:

The people I talk to are very experienced so you don't get the bull shit and you talk to them, the information you get is sound, backed up by practical knowledge and experience (F3).

Talk to neighbours […] yeah the parents - the father and father-in-law. They've been in the game a long time, they've seen a lot of things (F4).

The ability to talk to people and engage directly with the person providing advice (rather than reading information in a book or on-line) also emerged as being important to farmer participants. Farmer 4 illustrates this:

There's a list of names in a book there that I can probably pick up a phone and ring and find an answer to most questions (F4).

In addition to being able to talk to people to gather information, the ability to physically see or experience what other farmers were doing was also recognised by participants as being useful:

I could go and see what they were doing, and look at their systems in place (F3).

People that you watch and see that are, you know, look at their systems, go for a drive (F17).

Farm discussion groups were specifically identified as providing a good opportunity to seek advice and hear new ideas from other farmers – they provided a *sounding board (F13),* and *there's a lot of sharing of information without question […] they've made some good recommendations (F4),* with another participant confirming *I've picked up a few things from the older guys (F13).* At least ten of the farmer participants had been members of a farm

discussion group at some stage in their farming career. The moral support that farm discussion groups provided was also highlighted by farmer participants:

I set up a discussion group so I had peer support (F12).

The great thing is too, you sit in the car for 20 minutes, and you think shit these people [other members of the farm discussion group] have got the same problems that I have. I'm not the only one (F9).

In addition to other farmers, rural professionals were also identified by a number of farmer participants as being important sources of information – *go to people (F3)* who farmers could, and did, ring at any time to discuss things. For example:

I had a vet, an accountant, a lawyer and a bank manager and an agronomist, that's what I called my management team, and would talk with all of those… All those guys I could ring 24/7, just pick up the phone and talk to them (F17).

Several farmers noted the duration of these relationships and the weight they put on the knowledge/information that those people shared, illustrating that trust had developed over time. These farmers describe the trust they had in their stock agents:

We have a livestock agent that we've dealt with since the day we came [1998], and we have the perception that he looks after us very well (F4).

I've got a stock agent who I place a bit of weight on. He's one of the trusted advisers I suppose… I knew him previously because he was up in Wairoa, and he used to do work for us up there (F16).

5.2.6.3 A whole-farm view

Another factor that emerged as shaping farmers' on-farm practices was that participants' decisions were made at a whole-farm scale, accounting for a wide range of factors. While positive impacts on water quality were recognised as being beneficial, they were not

identified by any farmer participants as being a key driver of on-farm practice change. Instead, on-farm benefits such as *livestock controls (F3)* were specifically highlighted by some participants as being part of their decision-making processes. Farmers outline where water quality considerations fit in their decision-making:

It's a by-product really of a management decision based on livestock controls and erosion issues. Water quality to me downstream is probably not something I think about a lot. I don't want to be a polluter […] I do the right thing, but it's not forefront of mind, no (F3).

Water quality's a part of the whole equation. We tend to look at an overview rather than one particular thing, and they all add up to that end view really. I mean fencing off the gorge made good sense from water quality, from management, from best use for the land class. Yes it's a nice natural filter, but to say that we did it just for that reason, that would be lying. To say we just did it for management, well that wouldn't be right either. It's the whole package (F4).

It wasn't a conscious effort to fence off waterways originally, that was to stop stock dying in the waterways […] I was trying to, you know, cutting off corners because stock flow was a nuisance and I didn't have decent dogs and so it was easier to put a fence across there and plant trees in there (F12).

No farmer participants identified reducing the impact of their farming operation on water quality as a key driver for on-farm change, although they did acknowledge any improvements in water quality to be a positive side effect. As noted above, this was potentially a consequence of participants' lack of personal experience of declining water quality in the Tukituki Catchment.

5.2.7 Key findings about farmers

The key findings that emerged from the interviews about what shaped farmers' freshwater management practices were:

- Farmer participants had reconsidered some farming practices in response to changing societal views about the ongoing appropriateness of the impact of some farming practices on freshwater.
- Farmer participants' freshwater management practices had not been shaped by the active governing of the Hawke's Bay Regional Council.
- Farmer participants were constantly adapting their farming operations in an effort to be resilient to many variables that influenced them, including changing climatic conditions (particularly increasingly dry summers).
- Farmer participants did consider the impact of a change in farming practice on freshwater quality, but it was not the sole driver of change in any case.
- Based on their lived experiences, farmer participants questioned whether or not a decline in freshwater quality had occurred in the Tukituki Catchment.
- Change processes were inherently social for farmer participants as they sought information and advice about changes they were considering from trusted others, particularly those who had relevant practical experience, and who they trusted.
- Experiential knowledge (of their own and trusted others) was particularly highly valued by farmer participants in making practice change decisions.

5.3 Hawke's Bay Regional Council: A governing entity not actively governing farmers

Interviews with regional council participants focused on exploring how the organisation had engaged with farmers, changes in how the organisation had engaged with farmers, and also changes in how the organisation engaged in managing freshwater. How these processes of change had unfolded was also explored. As noted in Section 5.1 of this chapter, this research did not provide evidence of the Hawke's Bay Regional Council actively governing farmers' freshwater management practices. Instead, the regional council appeared to be grappling with how to respond to the changing expectations of both central government and the community about how the organisation should govern farmers, and more broadly manage freshwater. Section 5.3.1 explores what regional council participants considered to be the key drivers of change, followed by constraints and enablers of change that were evident within the regional council (Sections 5.3.2 and 5.3.3). Change within the regional council organisation appeared to be challenging to the participants, in part due to the legacy of the organisation. This was illustrated by the lack of examples of change that council participants provided during interviews. Divergent views amongst staff about how the organisation could and should change illustrated tensions within the organisation and had resulted in the organisation not actively governing farmers' freshwater management practices.

Table 5.2 provides some demographic information about the council participants, as well as their roles, and time with organisation for whom they were employed at the time of the interview.

Table 5.2. Demographic information about Regional Council participants

Participant	Gender	Age*	Role	Time with organisation
RC8	Male	65-75	Staff	35 years
RC18	Male	45-55	Manager	9 years
RC19	Male	45-55	Staff	9 years
RC20	Male	45-55	Manager	6 years
RC21	Female	45-55	Councillor	4 years
RC22	Female	50-60	Manager	18 years
RC23	Male	45-55	Manager	2 years
RC24	Male	50-60	Staff	12 years

* Participants age was not asked in the interviews and has been estimated within a 10 year age band.

5.3.1 Multiple drivers of change to freshwater governing approach

Regional council participants identified two key drivers that required change in the way that the regional council managed freshwater – namely legislative requirements and changing community expectations.

5.3.1.1 Legislative requirements as driver of change

Central government legislation (e.g. the NPSFM) was clearly articulated by council participants as setting out improvements in surface water quality that must be achieved - *We've got a job to do, it's in law (RC20).*

The NPS [NPSFM], the way I read it, is directing councils to do that. So actually get yourselves organised, identify - don't just report, identify where do the issues exist and then have a plan of how you're going to deal with those issues and do it with the community (RC19).

I don't know that you can have less regulation now that the NPS [NPSFM] is out, so that's drawn a line in the sand, and in some ways that's helpful (RC22).

The long delay in central government providing guidance about how they wanted freshwater to be managed was noted by a council participant and suggested to be a reason for a perceived lack of farmer action/change in freshwater management practices:

It took 20 years for central government to help shape the conversations. So it's not surprising that the farmers have sat there in a confused state saying what do we do, and these confused noisy debates going on around them and naturally you're not going to dive off and do anything until you understand well what are the rules here, what's expected of me? (RC20).

5.3.1.2 Changing community expectations

Council participants also spoke of a change in community expectations of the regional council, explaining that they felt *the community is expecting more too from us (RC18)* which was perceived to be a consequence of people becoming more interested in, and concerned about the environment. A number of council participants spoke of a need for the regional council to become a facilitator of conversations involving the broader community about what their aspirations were for freshwater and how those could be achieved. This was expressed by council participants as a need for the organisation to start engaging more with the *social elements (RC20)* that were part of the biophysical environments that regional councils had an established role in governing. These council participants explain what they thought the new role for the council was:

I think that we've got a responsibility for both the environment and the community, that it's not just the biophysical stuff but it's the people as well (RC19).

It's maintaining the understanding and focus on the biophysical because you need to understand how systems work and how they perform and whether they're getting better or worse. But moving much more into the well look the critical bit here is people (RC20).

A facilitation or intermediary role, or what was described by one participant as being the *bridge of knowledge (RC20),* was identified by several council participants as one that should be filled by the regional council, as these council participants outline:

So enabling them to think through all of that stuff is how we get all those additional gains, so we definitely have a role there (RC19).

We've got a role here to try and bring the conversations together and find agreeable outcomes for the future that people like and then figure out ways to achieve those and carry on working with people to achieve them (RC20).

Some council participants believed that the council had already started to engage with a broader range of people, acknowledging that there remained room for improvement in this area:

The Tukituki Plan is a good example of we had a go at talking to other industry people, so there was that pan sector group. We had a go at talking to some people in the community and working through things … It could have been better in the way it was done but at least we went some way down that track to doing that work (RC19).

A move to undertake more engagement with people was noted to represent *quite a shift in the thinking and attitude of regional councils (RC20)* because it was an activity that one council participant stated *I don't think the councils collectively have invested enough energy into (RC20)*.

The changing expectations of the broader community were in this case reflected in changing expectations from the elected members of the Hawke's Bay Regional Council of staff, also. As outlined in the Chapter Three, as a result of the 2016[43] local government election the membership of the Hawke's Bay Regional Council changed to *a Labour Green*[44] *council (RC21)*. This was a significant change for a regional council whose membership had historically been dominated by farmers. Farmers were replaced by members that held

[43] Interviews with the regional council participants all occurred in 2017, after the 2016 local government elections.

[44] In part as a consequence of the 1984 Labour Government's decision to end all farming subsidies, most New Zealand farmers have voted for the National Party, rather than the Labour or Green Parties (New Zealand's two other big political parties) (Hembry, 2008).

strong, widely publicised opinions about the regional council needing to play a more active role in protecting the environment. The change in councillors arguably reflected a change in the community or a sector of the community's beliefs about what activities the regional council should be prioritising. However one participant opines:

I think it's probably swung probably a little bit one way. You could argue that the previous council had swung too far the other way and I don't think it necessarily reflects a centre left, centre right kind of middle New Zealand type mix. If you look around the country there are pockets of - like I say Taranaki well that's very much the far right and that's very much a rural dominated council. You go to Greater Wellington and you've got a good blend of urban and rural so there's a changing dynamic there which is bringing much more of that urban reflection in (RC20).

5.3.2 The challenges of change resulted in inertia

While the need for the regional council organisation to change its approach to freshwater management was acknowledged by most council participants, examples of changes that had been successfully implemented were limited. Changes that were described by participants were generally of a functional rather than cultural nature, and also incremental rather than transformational in their magnitude. This council manager explains how they had changed the make-up of their team:

What we've tried to do in the last couple of years is balance the experience and expertise we've got in the team now. We employ someone with a heavy science background like the likes of [council staff member] … then the team can then suffer in other areas because you don't have that kind of general thing, and then if you have all generalists you don't have enough specialists. So there's a lot of balancing to be done there (RC18).

Another council participant who had been with the council for several years and moved into a leadership role explains the changes he had been involved with:

We've gone from that soil conservation work to broader issues around nutrient losses. When I came along it was shifting into rather than geographical areas and soil conservation, people had specialities as well. We split or restructured ourselves into intensive and extensive land use, so there was hill country and then there was intensive (RC19).

However, some participants expressed a contrasting view, believing that the council had undergone significant changes:

We've got a completely different kind of dynamic of people in the organisation today than I would argue they had in the 1990s when they [regional councils] set up (RC20).

While council participants spoke of some changes that had been successfully implemented, a number also spoke of further changes that were required. The structure of the organisation was identified as creating a constraint to effective communication within the organisation, as this participant describes:

There's been a structural problem I think in this council and the way that we have not linked up those things. So information gets reported up and then doesn't always find it down to the right people that are out there making a difference or working for people on the ground (RC19).

A *siloed (RC20)* organisational structure was identified by some council participants as constraining change within the organisation. However, other participants (eg. RC18) considered it to be necessary to enable the organisation to carry out all of its different functions. Another participant believed that:

In the old days…you had a compliance person and you had a bloody pest person and very structured and very siloed and very this is our knitting and we're sticking to it (*RC20)*

but that level of structure was no longer present within the organisation.

Tensions between different teams were also evident and suggested by council participants to result from different teams being *completely different animals and have different ways of going about things (RC18).* Another council participant describes their similar observations in a different way:

There are divisions in the way people view the world….there's quite a bit of work beforehand to get the community of the council together…actually have a lot of meetings to try and get people within the council to agree on a common approach (RC19).

A need for cultural change within the organisation was recognised by one council participant, who noted that such change required time and would be necessary before the council could facilitate change in the wider community. In the participant's view:

For change to happen out there, change needs to happen in here and that takes time. People, it's complex and organisation is complex… to get a whole cultural shift in an organisation takes as much or more time than it takes out there on a farm (RC19).

An unsuccessful effort to change the way the organisation worked was recalled by one council participant who recounts:

Actually [HBRC staff member] and I tried to get that happening years ago and then it didn't take off. Managers got involved and it didn't go anywhere. We were trying to do that from the bottom-up, to actually get people in council together to get better connections so that the issues got reported to people that then could actually put it into plans to how do we improve these things (RC19).

Another council participant recalled a particularly significant attempt made by HBRC to try a different approach to a plan change process, namely the Tukituki Catchment Proposal, and suggested that it was potentially *a step too far (RC20)* but should be respected because it illustrated a departure from Hawke's Bay Regional Council's usual approach of *setting a rule and then enforcing it (RC20)*. Setting regulations and then enforcing them were components

of the regulatory work that the regional council had always been involved in, and therefore reflected the legacy of the organisation. The impact of that organisational legacy is explored further in the next section of this chapter.

5.3.3 Regulatory and scientific legacy of organisation shaped change

References to regulation and science dominated the discourse of council participants which reflected views expressed by council participants that historically key roles for the organisation had been *play[ing] scientists and then rule makers and rule enforcers (RC20).* The comments of several council participants illustrated that a regulatory approach had historically been the council's primary means of addressing natural resource management issues. One council participant explains how they felt they had to fight to try alternative approaches:

I was surprised that early on when if we identified here's an issue, what is the council going to do about it, that there was so much debate over a regulatory hard-line approach and another approach which they just see as non-regulatory, like every other idea in the world is just called non-regulation like it's not important. That was seen as oh well you can have a dabble in that and when it fails we'll just do regulation. So I was surprised to have to advocate for that other approach and sometimes still have to do that (RC19).

Another council participant explained that until they had changed roles within Hawke's Bay Regional Council, they had believed that regulation should *drive how things are done (RC22)*. She explains:

This is something I found when I moved out of regulation, I thought oh there are other ways of doing things other than the RMA. So that was a key 'aha' moment for me moving out of regulation …is that you can achieve the same thing in multiple different ways. Whereas I've always worked in regulation it seemed to drive how things are done (RC22).

Some participants questioned whether regulation, which participants had also recognised as being one of the main roles of the regional council historically, should continue to be the organisation's focus. One council participant questions how effective the approach had been:

We've looked back in history and what have we got? All we've got is a list of bloody enforcement action […] what's happened to water quality? It's still declining. Well shit, what's the definition of stupidity? Carrying on with that thinking it's going to be different. So we've got to change something, we've got to reset it (RC20).

Several council participants expressed views that the council organisation needed to change and assume more of a leadership role in freshwater governing and be more proactive than they had been historically – moving away from being *at the bottom of the hill with its ticket book but it's up the top making sure that stuff isn't going to fall off (RC20).*

The comments of another council participant highlighted the bigger scope of the job that active freshwater governing presented to the regional council, and questioned whether a regulatory approach to the issue would be effective:

We really fool ourselves that we can sit someone on the top of every hill observing everything that's going on out there and catch it all and that that's going to fix things? (RC19).

Despite the apparent difference in views amongst council participants about how change should be achieved by the organisation, the language of participants illustrated a belief that the regional council would *get (RC19)* or achieve change, and that there was a causal relationship between change in farming practice and the actions of the regional council. This participant spoke of getting change:

We can get change out there in all sorts of ways (RC19).

Another council participant explains how he thought the council achieved change:

I think most importantly is getting that connection to standing on a rural bank and saying well all of that stuff you can see there is a problem in the stream because it's killing all these things and there's not fish there, whatever, and people can't swim there or whatever, and the reason that's happening is because what's happening over here on the land. We can tell you how that works to come from here to here and we know that we can stop that happening by these various interventions. Then going back and saying we're not only seeing that you're doing things over there but we're monitoring here and we're saying that the outcomes we anticipated are being achieved (RC20).

The above comments also illustrate an organisational reliance on biophysical science – illustrated by reference to the results of water quality monitoring to prove that outcomes had been achieved. Further comments of council participants illustrated the high level of regard that council participants had for scientific knowledge. One participant explains that *the science is a critical part of a policy development process (RC20).* Another participant describes how he had used scientific information to help farmers understand why they needed to make changes to the way they were farming:

So I used that… first meeting really, maybe it was the second meeting, we presented a whole lot of science information to them and I asked them two questions. One was do you agree that there's an issue? So have we got to that point now after this talking that you will accept that there is an issue here? They all said yes, so we can agree there's an issue (RC19).

Another participant explains how the overall approach taken in the Tukituki Plan Change process was based on science:

The regulation [in the Tukituki Plan Change process] came down to… we were focused on phosphorous thinking that that's on the science (RC22).

This participant explains how they had tried to use science differently in the next catchment-based plan change process that the Hawke's Bay Regional Council initiated after the Tukituki Plan Change:

That's the thing that I've worked hard in TANK[45] to do differently, got the primary sector really well engaged in the science and the modelling through a technical advisory group so that they feel like look this is something that you can trust and rely on…so that we can move the debate away from attacking the science to well okay where are we going to set the policy? (RC20).

Also evident in the discourse of council participants was a reductionist or *black and white (RC19)* worldview that contrasted and arguably conflicted with the highly contextual way that farmer participants viewed the world. One council participant commented that "*in my observation farms are, within reason they're the same, they've got paddocks and infrastructure*" (RC20). Such views are the antithesis of the nuanced way that farmer participants knew their farms and the intimate level of knowledge that informed their decisions about farm management practices.

Despite council participants expressing views that the regional council had historically relied on regulation to achieve change, as described in Chapter 3, the Hawke's Bay Regional Council had been regarded as having a relatively 'hands-off' approach to the regulation of farming practices. Regulatory staff of the council had had limited engagement with farmers, particularly sheep and beef farmers who participated in this research, as a consequence of farming activities predominantly being permitted by the regional plan[46].

[45] TANK stands for the Tutaekuri, Ahuriri, Ngaruroro and Karamu Catchments for which the HBRC pursued a combined catchment based plan.

[46] This is in contrast to the activities of dairy farmers, who all needed a resource consent within the Hawke's Bay region to undertake their dairy farming activity (reference).

5.3.4 Key findings about the Hawke's Bay Regional Council

The key findings to emerge from the data about what was shaping Hawke's Bay Regional Council's experience of change were that:

- Council participants recognised legislation and public expectation as requiring change within the organisation.
- The council appeared to be in a state of inertia as a result of uncertainty about what the organisation's role was in the new space of freshwater governing.
- Council staff practiced a range of different ways-of-knowing freshwater management.
- The council organisation appeared to be at an early stage of transition.
- There was a lack of clarity about the role of the organisation moving forward that appeared to create tension within the organisation.

5.4 Farmer - regional council relationships

The nature of the relationship between farmers and the regional council emerged as being primarily influenced by two key factors – direct, interpersonal relationships between land management staff and farmers, and also the generally indirect, distant relationship between elected council members and farmers. The nature of each type of relationship was very different – the first being primarily positive, and at the time of the interviews, the latter of a more negative nature.

5.4.1 Soil conservation partnerships

While the interaction of the land management team with farmers was acknowledged by all regional council participants, including those participants that worked as rural professionals, it was not identified by any council participants as being one of the core historical functions of the regional council, nor were many stories of engagement with particular farmers shared. Despite the organisation's legacy of soil conservation work this was an interesting omission.

In contrast, most farmer participants spoke of direct engagement they had had with regional council land management staff.

Soil conservation work emerged as being the catalyst for the majority of farmer - Hawke's Bay Regional Council/Catchment Board relationships. Several farmer participants (e.g. F3, F4, F14) referred to land management officers by name, illustrating relationships that had developed over extended periods of time. A number of farmer participants had received material support for work, through the provision of grants, or plants. The following comments of farmer participants illustrate that they considered the council to be a reliable source of tree planting advice:

I thought I might even get [HBRC land management officer] out and have a look at some, you know, if I plant some trees around some of these creeks or something in certain areas what I should do (F14).

They're the ones who are getting good advice probably from the land managing team at Hawke's Bay Regional Council (F12).

One council participant had been heavily involved with the delivery of soil conservation works by the Hawke's Bay Catchment Board, and subsequently the regional council. In describing the relationships he had developed with farmers, he emphasised that they were established over a period of time, and that he didn't *tell them [farmers] anything (RC8)*. The participant believed they were *not seen as the person who had the rule book, who was going to come in and just say you must do this (RC8),* which suggested that, at least in the participant's opinion, the situation had changed and the regional council has started to do that. As he explains further:

When we got around to talking about what needed to be done out there, umm…..call it trust, call it whatever you like […] you were never seen as the… enemy or anything like that, no (RC8).

If farmers were not engaged in soil conservation works and *work[ing] with us (RC20),* it was acknowledged by several council participants that farmers may not have had any direct relationship or engagement with the regional council. These council participants explain:

I think probably by and large the people who we engage with are the ones who want to work with us. I suspect there's a reasonably substantive group who don't really know us (RC20).

There'd be a lot who wouldn't have anything to do with them [HBRC] at all. Unless they did trees, poles or something like that but apart from that no they wouldn't have anything (RC21).

The comments of one farmer participant also suggest that land management staff may be less actively involved in on-farm soil conservation than they had been:

[HBRC land management officer] was our land management officer for a while, until he took the cruiser office job. Got lazy I think [laughs]. No, he was good. He still tries to peddle a few [poplar] poles every now and then (F4).

Less on-farm work by council land management staff potentially meant that the number of farmers that had a direct relationship with council staff had decreased.

5.4.2 Mutual respect between farmers and council staff

Farmer participants expressed a generally positive view of the Hawke's Bay Regional Council. Farmer's comments on the council included:

Hawke's Bay Regional Council is great (F2).

I'd say that our regional council is one of the better ones in the country anyway, in terms of land management, and working with people anyway (F4).

I think they're pretty highly regarded, I mean I don't bump into people who want to bag them at all (F10).

Some farmer participants expressed reservations about council staff's understanding of what practically occurred on farm, saying *it's real easy to sit in an office and say you need to do this, this, this and this (F4),* with another farmer describing the relationship between farmers and the council as sometimes feeling like it was *them and us (F16)* rather than *working together (F16)*. However, another farmer participant expresses an alternative view:

I found the council was quite helpful if anything […] I think if it came to a real crunch they would give us advice as to how best we could go about it. They're not farmers but they still have an understanding of it (F11).

The discourse of some regional council participants also illustrates a generally positive opinion about Hawke's Bay farmers and a belief that farmers endeavoured to do the *right thing (RC18)*:

All our operators [farmers] are really generally quite good (RC18).

I think we're always going to have that pyramid as I described where you'll have a bunch of people down the bottom who want to do the right thing and then a small minority up the top who are hard work. I think that's a reasonable representation of communities generally, I don't think farming is any different (RC20).

Farmer participants expressed less complementary views about the regional councillors themselves (as discussed next), but clearly separated in their minds their views about elected members and staff of the council.

5.4.3 Farmers' distrust of elected councillors

Despite evidence of a positive relationship between farmer participants and council staff emerging in this case, the relationship between farmer participants and elected members of the council was not illustrated in such a positive way. Specifically mentioned were public comments made by an elected member that openly criticised the practices of CHB farmers.

The elected member's comments are recalled by a council staff member: "*basically they're environmental vandals" (RC19)*. Such public[47] criticism of farmers was unprecedented behaviour by a Hawke's Bay Regional Councillor and was noted by a council participant to have *created a terrible impression of council (RC21)*. Farmer participants expressed critical views of elected members, with one saying he knew *plenty of people who think the current council itself is a bunch of dickheads (F10)*. Another participant opined that *I'd say there's a price on the ponytail of one of them, the scalp, seriously, that's the sort of talk (RC21)*. The development of tension between the council and farmers was plainly illustrated by such comments and appeared to have fueled the development of a perception amongst farmer participants that councillors had become disconnected from the farming community, with one farmer participant claiming that elected councillors were all from *within the 50 k sign (F6)*.

Council participants also recognised the change in the relationship between elected members and farmers that had occurred:

There's not a positive perception of regional council around here [CHB] I don't believe. There's a hugely negative perception of the governance (RC21).

The new councillors aren't engaging with CHB and they [CHB farmers] feel quite left out now. Like oh well we've had our chance and they just don't want to know about us now (RC23).

Another council participant referred to the *hangover (RC23)* of the Tukituki Proposal which they suggested was unlikely to go away for some time.

[47] The comments were made to and published by media.

Evidence also emerged from the interviews of elected members wanting to take a more directive approach with farmers, which council participants did not consider to be necessary nor appropriate:

Some of the [councillors] want to set up a land academy or something, institute, and come in and tell us how to do it. That's just I think that's ignorance. Who are they to come in and tell farmers who've been on the land for a hundred years how to, you know… it's like you're all ignorant and we need to tell you what to do (RC21).

The influence that elected members could have on the day-to-day operations of the council is also acknowledged by council participants:

*This council has indicated they want us to be tougher and that hasn't really been tested with them yet. Because before, during the last period of council when the current majority weren't a majority and they were an absolute f*cken pain in the arse, moaning about everything we did. But now they've turned around and saying they want us to be tougher (RC18).*

What are the most important issues in the past have been just identified by political priorities, who's making the most noise? What's most visible? Those sorts of things (RC19).

Potentially adding to the dislike of elected members expressed by a number of farmer participants was a realisation that the position of farmers in society had changed, and they no longer wielded the same political power that they had historically, as was discussed in the Case Description Chapter. A farmer participant sums up the problem:

All the representation's within the 50 k sign, and all the problems are outside the 50 k sign, so that's really fundamental (F6).

Another farmer participant expressed a view that any policies or approaches that were *going to upset them [urban]* were unlikely to be pursued because that's *too many votes (F4)*, illustrating a feeling of a diminished political power amongst farmers.

Although an indirect relationship, the behaviour of elected members/councillors emerged as shaping the dynamic of the relationship between the regional council and farmers, and not in a positive manner.

5.4.4 Key findings about nature of farmer – regional council relationship

The key points that have emerged from the interview data about the nature of farmer-regional council relationship were:

- Farmer-regional council staff relations were limited. Many farmers had no direct relationship with Hawke's Bay Regional Council, and many Hawke's Bay Regional Council staff had no direct relationships with farmers.
- If a relationship did exist, they had primarily been established as a result of soil conservation works being undertaken on the farmer's property, and were of a partnership style.
- HBRC was generally considered by farmer participants to be a good council, and council participants held positive views about farmers.
- Farmer participants expressed dislike and distrust of some elected members of the regional council, and generally the elected council as a whole.

5.5 Logics and legacy effects illustrated in data

To inform the discussion in the following chapter (Chapter Six), the institutional logics related to freshwater management are now introduced (Section 5.5). In addition, sticking points that were evident in the way that the regional council had/hadn't responded to change are also identified in an effort to draw attention to the way that the organisation's legacy, or

previous ways of working; framing and knowing; and pre-existing power relations, appeared to be constraining the organisation's ability to change (Section 5.5.2).

5.5.1 Logics through which participants engaged in freshwater management

5.5.1.1 Farmers' Productivist Logic

A logic, namely a productivist logic, was evident in the way that farmer participants engaged in freshwater management. As discussed in Chapter Two, a productivist logic has been reported by others (Higgins et al., 2016) to be evident in farmer behaviour. However, what constituted farmer participants' productivist logic in this particular case also had some unique characteristics that are outlined below. The productivist farmer logic illustrated was constituted by:

- A focus on land, livestock and financial security of the farming business
- An environmental dimension linked to activities such as tree planting
- Land based experience and knowledge
- Self-identification as farmers
- Adherence to farming norms
- A sheep farming family legacy (case specific)
- Close links with, and participation in, the community
- A high importance of relationships – both personal and professional, and direct and indirect (i.e. with broader society)

5.5.1.2 Regional Council Logics

Two logics were evident in the way that the regional council engaged in freshwater management with farmers. These logics were evident at the organisational level and were a productivist logic and an environmental protection logic. The constituents of each logic are identified below.

Regional Council Productivist Logic

- Trust in farmers
- Recognition of farmers' role as food producers and need to run financially viable farming operations
- A focus on land
- Partnership style relationships between regional council staff and farmers that focused on land
- Perception of farmers as stewards of the land

Regional Council Environmental Protection Logic

- Need to actively govern through regulation of farmers' practices
- Lack of trust
- Need for farmers to visibly demonstrate accountability
- Focus on water
- Council exercise power over farmers
- Perception of farmers as polluters

5.5.2 Sticking points of the Hawke's Bay Regional Council

As set out in Chapter Two, Waylen et al. (2015) contended that sticking points can be of an institutional, cognitive or political nature. Institutional sticking points arise from previous ways of working; cognitive sticking points from previous ways of framing and knowing; and political sticking points from pre-existing power relations. Sticking points of each type were evident and are articulated below in an effort to help make visible how the legacy of the council organisation appeared to be shaping change.

5.5.2.1 Institutional sticking points

- Change could not be achieved without formal rules and regulations
- Structure and hierarchical nature of organisation, including persistence of discipline-based teams
- Hands off approach to governing of farmers, and partnership style, one-on-one engagement related to land when engagement did occur
- Biophysical science focus
- Use of highly structured processes (e.g. plan change processes, enforcement processes) set out in central government legislation

5.5.2.2 Cognitive sticking points

- Persistence of a belief that farmers will change behaviour because of a rule/regulation
- Reductionist view – conflict with highly contextualised way farmers view world
- Dominance of scientific logic, and linked belief in single, or small range of solutions to problem
- Farmers were good stewards of the land
- Tension amongst disciplinary based teams within organisation due to different ways of framing

5.5.2.3 Political sticking points

- Historic dominance of farmer orientated elected members
- Recognition of farmers as good stewards of land
- Partnership style relationships between farmers and council staff

5.6 Conclusion

The results from the interviews have illustrated that, at the time they [the interviews] were undertaken, the Hawke's Bay Regional Council was not actively governing farmers. Instead, the council was grappling with how to change and adapt to the new space of freshwater governing in which the organisation needed to become active. Resistance to change within the organisation was evident and resulted from the practice of multiple ways-of-knowing by staff, and the need for the organisation to shift from a productivist logic to an environmental protection logic, which required a fundamental renegotiation of relationships between council staff and farmers. Sticking points emerged as shaping change within the regional council. Farmer participants were changing some of their freshwater management practices in response to societal changes in attitudes towards farming, and those changes were shaped by the productivist logic through which they engaged in freshwater management. The implications of these results are discussed in Chapter Six.

Chapter 6. Discussion

6.1 Introduction

This doctoral research sought to answer the question of what is shaping the governing of farmers, and the impact of their practices on freshwater, in a farming catchment in rural New Zealand? This research provided no evidence of farmer participants changing their freshwater management practices as a result of active governing by the Hawke's Bay Regional Council. Evidence of active governing of Tukituki Farmers by the Hawke's Bay Regional Council was in fact absent from the results. What was illustrated was a regional council that was grappling with changing expectations about how it would deliver freshwater governing in what was a new space for the organisation to be operating. Farmers had changed on-farm practices that impacted freshwater but in response to changes in societal attitudes towards farming – not the active governing of Hawke's Bay Regional Council.

This doctoral research focused at an intimate, micro-scale that examined the day-to-day experience of individual regime actors in a sustainability transition in New Zealand. The transition impacts farmers and agriculture, and the entities with responsibility for governing freshwater. Given that the behaviour of actors in transition processes in large part determines the pathway of a transition, understanding how individuals experience change helps to gain insights to the success (or otherwise) of transitions, and is a contribution that this research makes to the transitions literature.

The findings of this research reflect participant views at a unique point in time. As noted in Chapter Four, interviews with farmers occurred between August 2016 and February 2017, and with regional council participants between July and October 2017. As detailed in Chapter Three, this was after the Tukituki Plan was made operative (2015) but before specific actions were needed to be completed by farmers (the first regulatory deadline was 1 June 2018). This meant that participant farmers had not been proactively engaged by the regional council

in change, nor were farmers in the catchment required by regional council regulation or policy to make changes to their farming practices impacting on freshwater at the time interviews were completed.

As outlined in earlier chapters, the research question had three sub-components to it, and these are used to provide a general structure for this Discussion Chapter. The sub-components of the over-arching research question are: 1) what is shaping the governing of farmers, and their management of freshwater; 2) what is shaping the regional council's governing of farmers; and 3) what is the nature of the relationship between the two groups. Section 6.2 of this chapter discusses the findings of this research in relation to the sustainability transitions literature, given that a transition was one of the key contextual features of this case study. The following sections then examine what is shaping the governing of farmers, and the impact of their practices on freshwater (Sections 6.3.1 to 6.3.4). Sections 6.4.1 to 6.4.3 focus on exploring what was occurring within the regional council – the organisation charged with the task of actively governing farmers, but not visibly doing so. For completeness it is noted that the third component of the research question is covered across both the farmer and council focused sections of the chapter, and to avoid repetition is not specifically addressed in another separate section. In Section 6.5 changes that have occurred in the freshwater management and governing space relevant to this case are briefly outlined. The conclusions that can be drawn from the findings of this research are highlighted in Section 6.6.

6.2 A sustainability transition "in-the-making"

A sustainability transition "in-the-making" (Kohler et al., 2019, p. 18) was evident in this case that had implications for farmers and agriculture, as well as the way that freshwater was governed. Both farmers and regional council participants spoke of change that was occurring at both the landscape level (ie. in societal expectations, changes in climate) as well as at the

regime level (i.e. changes in central government requirements related to freshwater governing), which is illustrative of a transition.

The sustainability transitions literature argues that transitions are processes that are co-evolutionary, multi-actor, multi-level, long-term, non-linear, emergent and shaped by variation and selection (Chang et al., 2017; Grin et al., 2010; Loorbach et al., 2017; Zolfagharian et al., 2019). Not all of these characteristics of a transition were evident in this case - arguably in part because the transition studied was contemporary and not historic. The transition was illustrated to be co-evolutionary - radical change is needed across both the agricultural and freshwater governing domains. Multiple actors were involved - farmers and staff of the regional council were the focus of this research, but a broader range of actors across the regime, niche and landscape levels were also involved. Farmers' response to societal questioning of some farming practices illustrated that farmers in this research did not farm in isolation and their actions were shaped by the broader social context in which they operated. The changes to freshwater governing required of the Hawke's Bay Regional Council by central government involved for some individuals within the council, and the organisation as a whole, a complete renegotiation of their relationship with farmers - including the participants in this research.

As noted above, change was illustrated to have occurred at both the landscape and regime levels. Evidence of change at the niche level was limited, although this may have been as a consequence of the focus of this research on actors at the regime level. Change at the landscape level, in terms of changes in societal views about some farming practices, as well as the changing climate; had shaped farmer behaviour. Changes in freshwater governing were evidenced at the regime level, although evidence of the shift from the government of freshwater to governance of freshwater argued in the literature by Potts (2020) to be occurring was absent in this case. It is therefore still argued that a sustainability transition was, and still is, occurring in New Zealand agriculture, and only time will enable the outcome

of the unfolding transition process to become evident. The findings of this doctoral research can support the contention that contemporary transitions at the micro-level are co-evolutionary, multi-actor and multi-level.

Evidence did emerge in this case to support the arguments of transitions scholars such as Loorbach et al. (2017) that transitions did or did not occur as a consequence of change occurring at the level of the regime. Although the regional council was in a state of inertia, it was endeavouring to grapple with the change in freshwater governing that was required of the organisation by changes in central government legislation – a part of New Zealand's freshwater governing regime. The stability of the regimes within which farmers and the regional council were embedded made change for both groups difficult, and this is discussed in further detail in Sections 6.3 and 6.4. Kohler et al. (2019) argued that actors navigated transitions by fighting, negotiating, learning and building coalitions. It could be argued that farmer participants had learned about society's changing views of the appropriateness of some farming practices through media reporting and had navigated those changes by reconsidering and adapting some on-farm practices to reflect society's evolving views. What was also evident was tension amongst council staff about what the focus of the organisation's new role in freshwater governing should be – views/opinions that were shaped by the different ways-of-knowing freshwater management that staff practiced. That tension was illustrated to be constraining the council from navigating the transition.

This research has highlighted the challenges created by the structured nature of transitions analytical frameworks such as the multi-level perspective. It was evident in this doctoral research that both farmers and regional council actors were shaped by a mix of factors that reflected landscape, regime and niche forces. Actors did not just operate at one level of a transition. For example, one farmer interviewed was pursuing a regenerative agriculture approach to farming, which arguably is a niche approach to farming, so in one sense he was a niche actor. However, that farmer also spoke of the need to maintain a profitable farming

business which arguably reflects the mainstream or regime level productivist logic of farmers that was evident in this research. This farmer was arguably both a niche and regime level actor (or a hybrid in the space in between), and to classify him to be one or the other would not acknowledge an important part of his identity, nor the diversity that exists amongst farmers logics and approaches to farming. Similar issues can exist with any type of broadscale classification, including the identification of institutional logics, and as relevant in this case a productivist logic. As discussed further in Section 6.3, while production is central to farming, farming is not solely focused on production, at the cost of all other considerations (e.g. environmental considerations). This is illustrated in this research. Returning to the transitions literature specifically, the use of structured analytical frameworks to examine transitions was found to be useful in this doctoral research because it provided a means of conceptualising what is a highly complex and intertwined process of change. However, it is suggested that singular classifications should be applied with some caution (as they were in this research), and in the knowledge that they do prevent diversity within a group being recognised.

6.3 Productivist logic reflected in farmers' freshwater management

The freshwater management of the New Zealand sheep and beef farmers that participated in this case study emerged as being primarily influenced by a productivist logic. Key constituents of that logic were summarised at the end of the last chapter and some of those elements were specific to the case that was studied. While the influence of a productivist logic on farmers' behaviour has been reported in the literature (e.g. Higgins et al., 2016), the environmental dimension that was evident in this case has not been widely reported in the literature, and illustration of this is a contribution of this doctoral research.

The productivist logic illustrated was also reflected in farmer participants' identities and farming norms, and sustained and adapted through their ways-of-knowing and the

relationships and networks of which they were a part. While institutional logics and identity have been argued in the literature to be fundamentally interrelated (e.g. Thornton et al., 2012), and a link between the socially constructed concepts of farmer identity, farming norms and ways-of-knowing was argued in the conclusion of the literature review to exist, all of the concepts have not been brought together in the literature but rather used to explore particular aspects of farmers and farming – for example Burton linked the concepts of farmer identity and farming norms (Burton & Wilson, 2006). This research does not seek to draw a link between all of the concepts either, but rather uses multiple concepts to help make visible what has shaped individual farmers' experiences of change in a contemporary transition. Some commonality in farmer participants' experiences of change was illustrated, but diversity in individuals' change experiences was also evident. This reinforces the importance of farmers not being treated as a homogenous group, expected to respond in a consistent manner to change, and has been highlighted by other scholars (Burton & Paragahawewa, 2011). This research provides further evidence in support of calls for the need to explore and recognise diversity amongst groups of actors.

This part of the discussion is focused on answering the part of the research question that focused on what was shaping the governing of farmers, and their freshwater management practices. In summary, the answer to this component of the research question was illustrated as being:

- Farmer participants were not being actively governed by the regional council.
- Farmers' were changing freshwater management practices in response to an awareness of the impact of those practices on freshwater. Changes were shaped by farmers' dominant productivist logic.
- The productivist logic through which farmers engaged in freshwater was centred on land and livestock but was also constituted by an environmental dimension (ie. it was not solely productivist).

- What constitutes farmers' productivist logic, and specific practices that constitute good farming reflect the characteristics of the landscape, farm systems and social settings in which farmers operate.
- The productivist logic that dominated farmers' practices was reflected in their identity and farming norms and sustained and adapted through ways-of-knowing centred around practical experience and farmer networks.
- Farmers' networks are based on trust and influence their ways-of-knowing and ultimately how they manage the impact of their farming practices on freshwater.
- Farmers do not farm in isolation but are shaped by the dynamics of the landscapes and regimes in which they operate, as has been reported by others in the literature (Blackstock et al., 2010).

6.3.1 A multi-dimensional productivist logic evident

The productivist logic through which farmer participants engaged in freshwater management was primarily based around land and livestock and financial security of the farming business. It was also constituted by experiential, land-based knowledge; self-identification as good farmers, and adherence to good farming norms. The productivist logic as reported in the literature is heavily production focused - both literal production in terms of quality and quantity of livestock and crops; as well as financial viability of an operation, which enables further production. The results of this research showed that the productivist logic of the New Zealand sheep and beef farmers that participated in this research included other considerations such as environmental dimensions. The social relationships of farmers with others were also illustrated to have an impact on the way that they engaged with freshwater management. Environmental considerations were also evident in farmer participants' management decisions. One farmer participant described themselves as having grown up in the *tree hugging space* (*F10*), and multiple examples of participants engaging in practice change that had both production and environmental benefits emerged.

As it has been reported by others (e.g. Hunt et al., 2013; Knook & Turner, 2020), economic considerations emerged as a factor that influenced farmer participants' behaviour. All farmer participants had made changes to their farming operations to enable them to ensure (as far as possible) the financial viability of their farming operations, particularly in response to increasing dry periods. Self-conception as business people was evident in the results, as was the importance of sustaining the family farming business as has been reported by Knook and Turner (2020) in a New Zealand context. However, in this case, examples highlighted the lengths to which farmer participants had gone to continue farming sheep, despite the poor financial returns that sheep had delivered for many years. It is unclear whether the importance of continuing to farm sheep may have been a particularly strong driver in this case because of the legacy of sheep farming in the area and the high societal status that early run holders (who primarily farmed sheep) had held. In any event, the farming practices of those participants illustrated that continuing their family's legacy of sheep farming was important to them and taken into account alongside production considerations.

6.3.2 Farmer identity reflective of productivist logic

As was first argued by Burton and Wilson (2006), a person's self-identity is essentially socially constructed because a person's identity reflects society. In this case it was evident that farmer participants' self-identity was linked with a belief that the work of farming and farmers was inherently good, and that they were good farmers. The social or relational nature of identity and the need for individuals to verify their identities, which they use social situations to do, has been reported by a number of scholars (e.g. Fielding et al., 2008; Sulemana & James, 2014). Farmer participants historically had their identity as good farmers validated by society. Tukituki farmers had held a good social status and been able to generally manage their land as they saw fit. As set out in Chapter Three, in the last two decades the appropriateness of some farming practices has been questioned in New Zealand. This has meant that farmers' self-identities as good farmers were no longer being

validated by the broader public as they had been in the past. The ongoing appropriateness of some farming practices, such as stock accessing drinking water from streams, had been publicly challenged. In this case several farmer participants had worked over an extended period of time to install reticulated stock drinking water supplies. Farmer participants cited animal health benefits (arguably productivist reasons) as the primary reason for doing so; however, benefits to water quality were also acknowledged by some farmer participants to result from such practice change. Arguably societal pressure (the "expectations and desires of generalized others" (Fielding et al., 2008, p. 25)) to keep stock out of waterways and not have them standing in freshwater *mucking it up (F14)* had played some role in farmer participants' changing on-farm practices. McGuire et al. (2015) observed a similar response from American farmers who were under increasing societal pressure to reduce or eliminate the impact of farming practices on water resources. The farmers had found it challenging to verify their good farmer identities. In this research, when directly questioned about what influence water quality considerations had on their management decisions farmer participants stated that positive effects on freshwater had not driven changes in their farming practices in and of itself. Instead, participants stated that multiple on-farm benefits needed to arise from a change in practice before they would adopt it, which has been observed in the New Zealand context by others such as Bewsell et al. (2007). The evidence in this case, such as that discussed above in relation to stock drinking water supplies, would suggest that retaining or regaining their status as good farmers had led farmer participants to consider adopting farming practices that had a reduced impact on freshwater, and when multiple on-farm benefits resulted from a practice change, farmer participants were willing to adopt it.

Farmer participants all described themselves "first and foremost" (Burton & Wilson, 2006, p. 110) as farmers, and in several cases sheep and beef farmers. Burton and Wilson (2006) were amongst the first to argue, based on their British study, that all farmers (to varying

degrees) based their self-conceptions around primary production-based roles and perceived themselves as people that produced food (and to a lesser extent fibre) with the aim of maximizing food production and passing on an economically viable farm business to the next generation. The discourse of farmer participants in this case also illustrated that they considered food production to be one of their primary functions.

6.3.3 Productivist nature of good farming norms

If the basis of an individual's self-conception was a particular social identity (e.g. a farmer), Fielding et al. (2008), who explored Australian farmers' engagement in sustainable agricultural practices, argued that individuals' behaviour could be expected to become group-based and guided by the norms of that social group. Many examples of farmer participants' decisions about on-farm practices being influenced by good farming norms emerged in this case and farmer participants demonstrated high levels of commitment to their farmer identities and acknowledged the benefits they received in return in terms of the support of their local farming communities, which Burton and Wilson (2006) argued were the benefits of group membership.

Although the concept of good farming norms has been primarily associated in the literature with production as it is based on visual displays of a farmer's productivity, the socially constructed nature of good farming norms has also been widely reported (Burton, 2004; Burton & Paragahawewa, 2011; Thomas et al., 2019). If farmers' skills were not being visually assessed by others, the visual appearance of a farmer's land and livestock would not assume such symbolic value, and changes in on-farm practices to those that do not reflect or align with productivist values may occur more quickly. This research illustrated how farming activities that were arguably not primarily production related, could be framed in a productivist manner, which enabled them to become accepted good farming norms. As discussed by several farmer participants, a change in societal attitudes towards clearing land

(arguably a landscape level change) had occurred. Tree planting (rather than land clearing) is now recognised as a symbol of good farming and was practiced by all farmer participants, but it had arguably taken decades for the norm to change. Farmer participants spoke of tree-planting in relation to the animal health benefits that it provided – linking the activity with productivity and farmers' identification as good stockmen, rather than focusing on the benefits for water quality it can provide. Tree-planting had also allowed farmer participants to keep *soils on the hill so that they remain productive (F12).* The ability for tree-planting to be linked with the production of good quality livestock and protection of productive land arguably supported the recognition of tree-planting as a good farming norm. Recognition of the need to care for land also illustrated farmer participants awareness of their stewardship role.

One farmer participant's recollection of his initial attempts to grow maize on his farm, and the need to *poke it in well away from the road so nobody could see it (F16)* [in case it failed] illustrated the role of visual representations of farming. The good farming literature recognises and explores the symbolic meaning farmers attach to the visible on-farm choices they make and this research, as has recent work of other scholars (e.g. Burton & Paragahawewa, 2011; Thomas et al., 2019; Thomas et al., 2020), has affirmed that the visual appearance of farms continues to provide the basis for how farmers gauge the farming skills of others, and the alignment of those with farming norms. The symbols of good farming that emerged from this research were land and livestock based, and placed land and its management as central to the construction of a farmer's self-identity, as does the work of Burton (2004) and others (Haggerty et al., 2009; Sutherland et al., 2013). The (relatively) static nature of land meant that farmer participants could effectively display their good farming skills on it and through it. Some farmer participants expressed concerns that have been articulated by other scholars such as Thomas et al. (2019, p. 111), that the "(im)materiality, unpredictability and untidiness" of riparian environments made them a

more challenging environment in which to demonstrate their skills as good farmers. If new freshwater friendly farming practices are not consistent with local good farming norms then those new practices are unlikely to be adopted, or at least slow to be adopted, as ultimately appearances do still count. A reduced reliance on the visual observation of other farmers' skills and provision of assistance to farmers to learn and understand how other, less production focused symbols, could demonstrate good farming skills was contended by Thomas et al. (2020) to potentially enable farmer practice change that did not align with current good farming norms. The results of this research suggest that provision of assistance to farmers in the Tukituki Catchment to do this would be an idea worth considering.

What emerged as being a characteristic of a good farmer in this case, which has not been reported by others, was a farmer's involvement in and contribution to the broader community. It was not just the actions of a farmer on-farm that emerged as influencing their status as a good farmer, but also their actions off-farm. Being *a good community man (F16)* emerged in this case as an attribute of a good farmer. The reason this has not been reported by others is not entirely clear – perhaps the focus on the relational components of good farming norms is what has surfaced it in this case. Potentially the physical isolation of the communities around which farmer participants lived and the need for those communities to be relatively self-sufficient increased the importance of farmers being actively involved in the community. Another contextual factor that may have influenced the finding was the hardship that farming communities in New Zealand endured as a consequence of the neoliberal reforms of the 1980s which in CHB also coincided with a series of droughts that created a particular need for farmers to pull together and support each other. That hardship created significant financial stress for many farmer participants that meant their energy was focused on *clinging on (F6)*. In any event community participation by farmers emerged as a component of the local good farming norm in this case.

Other scholars have observed changes in good farming norms over time (e.g. de Krom, 2017; Sutherland et al., 2012), and examples of this were illustrated in this case, also. Burton (2004) argued that it was critically important for time to be provided by policy makers to allow new farming practices to be integrated into farmer's notions of farming roles, become recognised as good farming practice, and be integrated into farmers' status system as a demonstration of good farming. Time is needed because this process required farmers to revisit their self-perceptions, their systems of status transfer and the meaning of individual farming acts. Ultimately change in good farming norms necessitated change in the social fabric of farming communities. This research was actually undertaken in a context where time had been allowed for changes to occur in on-farm practices, as the new regulations of the Tukituki Plan were finalised in late 2015 but did not require farmers to make any practice changes until mid-2018. As already noted, a number of farmer participants had started, and in some cases, completed farm plans for their properties (not required until 1 June 2018), and acknowledged that *there will be some positives come out of it (F16),* but also that *it's like all these things … everyone throws their arms up but once you get into the routine of it it's not that bad (F16)*. The 'routine' the farmer participant referred to is arguably the process of farm plans becoming accepted as a symbol of good farming, which was illustrated to have started. The absence of acknowledgement by any regional council participants of the fundamental nature of change that was required by farming communities to accept changes to good farming norms suggested that this allowance of time had not been provided to facilitate such change.

6.3.4 Shaping influence of farmer networks

As illustrated in Chapter Five, and as has been argued in the literature (e.g. Blackstock et al., 2010), farmers have relationships with many others, including other farmers, neighbours, their surrounding communities, rural professionals, staff and/or elected councillors of local governing entities as well as the broader public – a relationship that while less direct in

nature emerged as important in this case. Many farmer participants spoke of trust shaping their relationships – particularly relationships with rural professionals.

Public opinion, or what is argued in the context of this discussion to be the public's trust in farmers, or loss of trust to be specific, emerged as playing a key role in farmer's self-assessment of the ongoing legitimacy of their farming practices and identification as good farmers. As discussed in Chapter Three, since the early 2000s, questions have been asked, first by environmental groups, but latterly by members of the wider public about the acceptability of the impacts of some farming practices on the environment. Farmer participants interpreted this public questioning as illustrating a loss of public trust in them and their farming practices. Although evidence did not suggest that this loss of public trust directly impacted farmers freshwater management practices, what did emerge was evidence of farmers reviewing their self-identities as good farmers and contemplating how they could protect/retain that status.

The importance of longevity, consistency and regularity of contact in facilitating the development of trusting relationships between individual farmers and their advisors has been reported by others (e.g. Thomas et al., 2020). This case illustrated that these factors had enabled the establishment of trusting relationships between farmer participants and members of the regional council's land management teams in relation to soil conservation work. The two groups had historically enjoyed a generally constructive relationship. In contrast, several farmer participants lamented the increasing lack of connection between urban and rural people. The absence of a direct relationship made the establishment of trust difficult and had resulted in some farmer participants losing trust in the public.

The multi-level nature of trust was argued by Sharp and Curtis (2014) to potentially create challenges for the development of trust in an organisation. Farmer participant's lack of trust in the elected members of the regional council was evident in this case. As was traversed in

Chapter Three, at the time the interviews were undertaken the relationship between the elected members of the regional council and farmers in the Tukituki Catchment had been for several years, and continued to be, what can only be described as turbulent as a result of the uncertainty about whether or not the Ruataniwha Water Storage Scheme would progress. This had created frustration and arguably mistrust between farmers and the elected members of the council. Evidence that the regional council had recognised the need for the competency, integrity and benevolence of the entire regional council organisation (elected members included) to be demonstrated to the Tukituki farming community that the organisation was attempting to govern was absent from this research, and was argued by Sharp and Curtis (2014) to be necessary if farmers were to trust land management advice delivered by the organisation. However, it is also noted that the organisational shift required of the regional council in the logic through which it engaged with and sought to govern farmers (changing from a productivist logic to an environmental protection logic) would require a fundamental renegotiation of the relationship of the council with farmers in any event. Trusting partnerships in which farmers and regional council land management staff worked alongside each other may continue for some Tukituki farmers, however all Tukituki farmers would have to engage in some manner with the council's regulation teams, who would actively govern farmers through the enforcement of regulations – a situation in which the ongoing importance of trust in farmer-regional council staff relationships was unclear.

6.4 A regional council failing to actively govern farmers

In this case, evidence did not emerge of the Hawke's Bay Regional Council actively governing Tukituki farmers. The council appeared to be in a state of inertia, struggling to decide how to respond to pressure from both central government and the wider public to change as a consequence of the transition that was occurring in New Zealand at the time this research was undertaken. The organisation was grappling with its response to what was arguably a shift in the governing of local government that required the organisation to change the way

that it governed freshwater, and thus farmers; which was an experience further complicated by the complexity of change within the organisation.

In contrast to the relatively extensive literature that explores farmer behaviour change, change within natural resource management agencies (which as set out in Chapter Two regional councils are argued to be) is not yet a well-served academic field. Potts (2020) also argued that the empirical NRM governance literature had focused on evaluating different approaches to governance, rather than exploring change within NRM organisations themselves. This research makes a contribution to that developing area of literature in its presentation of empirical findings about what was shaping change within an NRM agency in transition. The research focus on individual's day-to-day experiences of change, rather than the evaluation of a particular governance or implementation approach, makes this research a novel contribution at this time.

This part of the discussion is focused on answering the part of the research question about what is shaping the regional council's governing of farmers. The discussion has been separated into three sections. First, the relevance of the findings from a NRM governance perspective are contextualised and explored (Section 6.4.1). Evidence of resistance to change emerged, and as has been indicated in Chapter Two, made visible using the concepts of sticking points and institutional logics, and the implications of those results are discussed in the remaining two parts of the council focused sections of this chapter (Sections 6.4.2 and 6.4.3). In summary, the answer to this component of the research question was illustrated as being:

- The regional council was in the early stages of a transition in freshwater governing from a council that had not actively governed farmers to one that would govern farmers through formal regulations. This has been conceptualised as a transition at an organisational level in the way that the regional council governed farmers that

was guided by a productivist logic to one reflective of an environmental protection logic.

- The council was in a state of inertia – unable to actively govern farmers.
- The shift that the regional council needed to make from a productivist logic to an environmental protection logic necessitates a fundamental renegotiation of the relationship between farmers and council staff.
- Change within the regional council was shaped by individual staff, whose identities reflected the practice of multiple ways-of-knowing; as well as organisational level constraints/enablers such as cognitive, institutional and political sticking points.
- As with farmers, council participants experiences of change were different as they reflected their own identities and ways-of-knowing, as well as the logic through which they engaged in freshwater management.

6.4.1 A shift to the government of freshwater

As noted in Section 6.4, changing expectations of both central government and the public effectively required a shift in the institutional logic through which the regional council engaged in the governing of farmers from a productivist logic to an environmental protection logic. Instead of essentially leaving farmers to manage their land as they saw fit, the regional council was required by changes at the landscape and regime levels to shift into a new space in which the organisation actively governed farmers and the impact of their practices on freshwater. It has been widely argued in the water governance literature (e.g. Floress et al., 2015; Potts, 2020) that governance entities had, or were in the process of, adapting their ways of working, and adopting more collaborative approaches to water governance that moved away from technocratic, top-down approaches that used fixed regulations to try and achieve change. That is not what was illustrated in this case. Instead, a regional council that had historically left farmers to manage their land as they saw fit had introduced a range of new regulations that restricted or required change in farming practices. Instead of a shift

from freshwater government to governance, arguably in this case a shift towards (or back to) freshwater government was evident.

In this case government (both central and local) appeared to be the most important source of decision making in the environmental field – challenging the contention of Armitage et al. (2012) that that was no longer the case. Central government regulation (the NPSFM) had prescribed, with increasing levels of detail over the iterations of the NPSFM, what local government must achieve in freshwater management. The following five components were argued by Armitage et al. (2012) to reflect an environmental governance approach: 1) recognition of the importance of fit and scale; 2) approaches that fostered adaptiveness, flexibility and learning; 3) coproduction of knowledge from diverse sources; 4) understanding of new actors and their roles in governance; and 5) changing expectations about accountability and legitimacy. Arguably none of these elements of an environmental governance approach were illustrated in this case. Farmers were considered by regional council participants to be a generally homogeneous group, and farms *within reason they're the same (RC20)*. Recognition of the need for new freshwater regulations to accommodate differences between farms, farmers and farming operations was absent in this doctoral research. The introduction of fixed regulations through the Tukituki Plan did not foster adaptiveness or flexibility. Any evidence related to the co-production of knowledge was absent. Evidence of regional council staff being aware of different ways-of-knowing freshwater (practiced by farmers compared council staff and also amongst council staff) was limited, and thus the need to overcome the issue had not been recognised. Some evidence did illustrate recognition by council participants of a need for new actors within the freshwater management space to be accommodated – particularly tangata whenua[48]. As

[48] 'Tangata whenua' literally translates to 'the people of the land' and discussions the indigenous Māori people of a particular area of New Zealand, or the country as a whole ("Collins Dictionary," 2021).

outlined in Section 3.2.3, mana whenua had expressed a desire to have more opportunities to be actively involved in the management and governance of freshwater, and the council had endeavoured to create those. However, as the council organisation was grappling with definition of its own role in freshwater governing, it was not in a position to understand how it would relate to and engage with other actors, including farmers and tangata whenua. An awareness amongst council participants of changing expectations of accountability and legitimacy was illustrated. In fact it was these changing expectations that appeared to be causing inertia within the organisation, as it sought to figure out how to respond to those changing expectations. Arguably this illustrated that a transition towards environmental governance had started in New Zealand, and the Hawke's Bay Regional Council was in the early stages of that transition.

Somewhat in contrast, several elements of what the literature (e.g. Potts, 2020; Waylen et al., 2015) has suggested were characteristics of government were illustrated in this case. The need to change regional freshwater regulations was required by central government legislation, new regional regulations were static in nature, and scientific knowledge appeared to be privileged by the regional council in their policy making processes and provide the basis on which management decisions were made. Although a number of regional council participants acknowledged the need to incorporate other types of knowledge in freshwater management processes, such as *the social elements (RC20)* as well as the views of tangata whenua, evidence that illustrated how this had been done was limited. It is argued in this thesis that the introduction of the NPSFM11 constituted an attempt to recentralize freshwater management in New Zealand, and demonstrated a regression to a more traditional command and control style approach to freshwater governing, or to use the terminology of Armitage et al. (2012), a shift towards the government of freshwater (and farmers) rather than a transition towards freshwater governance. This case illustrated the ongoing use of command and control approaches that

used top-down, technocratic decision making, and fixed, static regulations to try and achieve change – approaches that have been argued in the literature (e.g. Floress et al., 2015) to have failed to effectively manage freshwater. Despite the popularity of integrated water resource management across the water governance literature (Edelenbos & van Meerkerk, 2015; Pahl-Wostl et al., 2020), it was not a concept that emerged from this research. It is noted that in July 2017 (after the data collection period for this doctoral research), a paper[49] was taken by staff to the elected members of the Hawke's Bay Regional Council seeking authority for staff to adopt an integrated catchment management approach. This change in approach was endorsed, and a corporate restructure establishing an Integrated Catchment Management Group occurred in July 2018. However, given the timing of this change it is not discussed here further.

Providing an illustration of a governing entity that appeared to be moving towards freshwater government, rather than shifting towards more collaborative approaches to freshwater management, challenges the dominant discourse in the water governance literature and is a contribution that this research makes. The findings in this case may be reflective of the relatively hands-off approach that has been taken to managing the impacts of farming on the environment, in this case in the Tukituki Catchment of the Hawke's Bay region, but arguably across New Zealand more generally. As noted in Chapter Two, much of the water governance literature (both normative and empirical) has been set in a European context, where farmers, and the impact of their practices on the environment, and including on freshwater, have been actively governed for decades as a result of the Common Agricultural Policy. Arguably farmers in the Tukituki Catchment have not been subject to command and control approaches to governing, the failure of which has been argued by

[49] Council paper accessed via Hawke's Bay Regional Council website, 18 February 2021, http://hawkesbay.infocouncil.biz/Open/2017/07/ESC_12072017_AGN_AT_WEB.htm

scholars such as Floress et al. (2015) to be one of the drivers for the shift towards more collaborative approaches to water governance.

6.4.2 Challenges of conflicting logics and multiple ways-of-knowing

What appeared to be constraining change within the regional council was resistance to the shift required in the way that the organisation engaged with farmers from a productivist logic to an environmental protection logic. Further complicating the transition required of the organisation was the multiple ways-of-knowing that were practiced by regional council staff. Evidence of operational, regulatory and scientific ways-of-knowing freshwater emerged from the results, and arguably intensified the challenge that achieving an organisational transition presented.

6.4.2.1 Organisational level shift from productivist to environmental protection logic required

As noted in Section 6.4, changing expectations of both central government and the public effectively required a shift in the regional council's organisational logic (in relation to governing farmers) from a productivist logic to an environmental protection logic. The illustration of these logics is a contribution of this research, but may also be reflective of the central role that agricultural production had, and arguably continues (to a degree) to play, in forming the "backbone" of New Zealand's economy (Hunt et al., 2013, p. 2), and the need for production to not be constrained by government (noting of course New Zealand's shift towards a neoliberal approach to governing in the 1980s). New Zealand has also arguably been slower to recognise the impact that farming can have on freshwater than other areas of the world such as Europe, where changes to agricultural policy to provide increasing levels of environmental protection have been occurring for decades. The identification of these logics may also reflect the focus of this research on change within an NRM organisation which was highlighted by Kirsop-Taylor et al. (2020) to be an area that had attracted limited attention in the empirical literature.

Instead of continuing to engage in freshwater management through a productivist logic that viewed farmers as good stewards of the land, the council needed to shift towards engagement with farmers through an environmental protection logic that effectively branded farmers as polluters of freshwater who required active governing through regulation. This shift would effectively move the regional council from a space in which they had trusted farmers to manage their land appropriately – acknowledging that land needed to be used to produce food and to sustain viable farming operations; to a space where the organisation more actively governed farmers through the introduction of fixed regulations that restricted some farming practices. New regulations required farmers to demonstrate accountability for both on and off-farm effects of their farming operations. Instead of farmers being enabled by the regional council to use their land as they saw fit, farmers would instead be subjected to greater scrutiny of their farming operations, which required a radical renegotiation of the relationship between farmers and the Hawke's Bay Regional Council.

Evidence emerged from this research of a growing demand from the community for freshwater governance (rather than government) and increasing expectations about how proactively the regional council would manage freshwater, and farmers impacts on it. The comments of several council participants illustrated an awareness amongst council staff of changing expectations of the wider community[50] and their growing desire to be actively involved in, and ultimately beneficiaries of, improved freshwater governing and management. Evidence of the dissatisfaction of some elected councillors about how the organisation had historically managed freshwater emerged, also. The existence of trust between society and farmers had also been challenged, and arguably as a consequence of these landscape and regime level changes the regional council needed to shift towards an

[50] 'The community' in this instance was not defined by council participants, however appeared to encompass the range of stakeholders that the regional council engaged with about freshwater management including tangata whenua, industry groups, environmental groups, and well as members of the general public.

environmental protection logic that provided clear protections for the environment by actively governing farmers and the impact of their practices on freshwater.

Evidence of resistance amongst council staff to an organisational shift from a productivist logic to an environmental protection logic emerged from this research and appeared to be in part a consequence of the multiple ways that council staff knew and engaged with freshwater management, farmers, and farming, the implications of which are discussed further in the next section of this chapter. The diversity of ways-of-knowing practiced by council staff appeared to present another constraint to the organisation changing to become a council that actively governed farmers.

It is stated in Chapter Two, that this research reflects the definition of institutional logics suggested by Brodnik et al. (2017) and others that focuses on the role that logics play in providing meaning to people's daily activities. That definition reflected a view that logics are socially constructed patterns of symbols and practices by which individuals and organisations provide meaning to their activities. The productivist logic through which council staff had engaged with farmers was well illustrated - supported by examples of historic practice from multiple participants. The environmental protection logic to which the organisation needed to shift was not as well illustrated in the results. Evidence of council participants themselves engaging in freshwater management and the governing of farmers through that logic was limited. The environmental protection logic had been constructed by elected members of the regional council, central government and members of the community who wanted freshwater in the Tukituki Catchment to be improved. In this sense, the environmental protection logic was not socially constructed by the historic experiences of the council staff that needed to engage in freshwater management and the governing of farmers through it. The staff of the regional council were being challenged to shift towards and engage with an externally developed and assigned logic – which may provide some explanation for their hesitancy in doing so.

The transition in organisational logic that the introduction of new central government regulations required represented a transformational shift for the organisation. Active governing of farmers by the Hawke's Bay Regional Council was new, as was engagement between farmers and the regional council that was not focused on land. This was a new space, in which the farmer-regional council staff engagement needed to be re-negotiated. Arguably the change also required a renegotiation of the regional council's relationship with central government. Potentially complicating the transition in logics was the multiple ways that council staff knew freshwater. The divergence in ways-of-knowing freshwater practiced by council staff was more marked than that amongst the farmer group, and presented an additional challenge to achieving change within the organisation, as discussed in further detail in the following section.

6.4.2.2 Means of working with multiple ways-of-knowing required

Evidence emerged from this research of council staff practicing three different ways-of-knowing freshwater. An operational way-of-knowing, a regulatory way-of-knowing and a scientific way-of-knowing were evident at the individual level, and the illustration of multiple ways-of-knowing being practiced within an NRM governing entity is a contribution of this research.

The Hawke's Bay Regional Council has always had a role in freshwater governing and management. As a consequence, council staff have had to engage with the matter and the manner in which they have done so has reflected each individual's way-of-knowing freshwater. Staff that practiced an operational way-of-knowing engaged in freshwater management primarily through soil conservation work – recognising that helping farmers to improve the productivity of their land by *keeping the land on the land so that I can use it (F3)* would also have consequential benefits for water quality. Staff primarily influenced by the operational way-of-knowing water quality were land management staff who worked

alongside farmers in a partnership style manner, working to improve land productivity. In contrast, council staff dominated by a regulatory way-of-knowing recognised freshwater governing and management as something that the regional council was required by central government (and specifically the NPSFM) to become more actively involved in, and change would require (at least to some degree) the introduction of new regulatory frameworks that more actively governed farmers and required them to make on-farm changes. Finally, those staff whose perspective on freshwater management was guided by a scientific way-of-knowing considered freshwater quality to be a certain problem (i.e. had been proven by the results of scientific monitoring to exist) that needed fixing, and, based on scientific analysis, a number of farming activities that had negative effects on freshwater quality could be identified, and stopped, and as a result of that process improvements in freshwater would be realized. A scientific way-of-knowing freshwater was also observed to be practiced by Canterbury Regional Council staff by Duncan (2016).

The existence of multiple ways-of-knowing created a challenge for change within the organisation and was complicated further by the shift in organisational level logic that needed to occur also. The multiplicity of ways-of-knowing practiced by staff created conflict and tension between staff. Changes were needed within the organisation that enabled the divergent ways-of-knowing practiced by staff to be worked with, as has been recognised in the New Zealand context by Duncan (2016). Farmers and regional council staff also practiced different ways-of-knowing, and farmers' experiential ways-of-knowing conflicted particularly with regional council staff that practiced a scientific way-of-knowing freshwater, as was also highlighted by Duncan (2016).

6.4.3 Legacy effects constrained change

Sticking points of an institutional, cognitive and political nature (Waylen et al., 2015) that were illustrated in this case were identified at the end of the previous chapter. The

identification of multiple sticking points provides one explanation for the slow speed, or almost absence of change observed within the regional council organisation, and as argued by Waylen et al. (2015) should moderate expectations about how quickly organisational change is likely to be achieved. The illustration of sticking points within a governing entity experiencing a transition is a contribution of this research in itself, as few scholars have utilised a sticking points framing in analyses of NRM governing entities.

6.4.3.1 Institutional sticking points

The regional council's previous ways of working emerged as institutional sticking points that constrained change in the way that the organisation worked. The persistence of a belief in the need for fixed regulations to achieve change reflected historic command and control approaches to freshwater management. The ongoing use of fixed regulations inhibited farmers' ability to maintain flexibility and adapt to the ever-changing conditions in which they farmed. The ongoing use of fixed regulations built on the experience that the regional council had with environmental regulation, which was not only reflected in the regulatory documents of the organisation, but also the council's structure. The ongoing biophysical focus of the organisation was evident in the language used by council participants and created another institutional sticking point for the organisation - limiting the range of solutions considered to address the freshwater problem. An image of "science to the rescue", a phenomena observed by Smallman (2020, p. 589), appeared to persist amongst council staff – illustrated by council participants references to the centrality of biophysical science to policy development processes and the ability of science to identify solutions to freshwater problems. The council's experience *play[ing] scientists and then rule makers and rule enforcers (RC20)* appeared to create an institutional sticking point for the organisation. Ongoing roles in biophysical science and regulation were identified by council participants as being ways of working that the organisation must continue to fulfill. Alternative approaches to governing freshwater and farmers that did not rely on science and regulation were not

evidently contemplated by council participants – constraining the way that the organisation approached its new role in the active governing of farmers.

The persistence of a highly structured organisation, in which staff were members of disciplinary based teams, and generally worked within those teams, was another institutional sticking point that emerged and has been described in the literature by others such as Waylen et al. (2015). They argued that such a "silo culture" limited the ability of people to work together and connect issues, which was a frustration expressed by several council participants in this case (Waylen et al., 2015, p. 6). Contemplation of a fundamental reorganization of the way the regional council organisation was structured was absent. Acknowledgement of some restructures that had occurred within the organisation was made by several participants. However, these were small, within team restructures, rather than a fundamental re-organisation of the organisation and how it functioned.

The Hawke's Bay Regional Council's relatively hands-off approach to the governing of farmers was arguably a consequence of the productivist logic through which the council had engaged with farmers. Few farmer participants had had interactions with the regulatory teams of the council and engagement between farmer participants and the regional council had predominantly been in a partnership style manner, related to soil conservation work and was framed by the council's productivist logic. It is not known whether the low level of regulatory based engagement that had historically occurred in Hawke's Bay was peculiar to the region, or whether similar approaches had been adopted by other regional council's in New Zealand. In any event the low level of regulatory based interaction was in stark contrast to the high level of active governing that farmers in other parts of the world had experienced, including in Europe and Britain as a consequence of the Common Agricultural Policy of the European Union (Knook et al., 2020). The lower level of active governing illustrated in this case shared some similarities with the Australian context, where a neoliberal approach to governing more similar to the New Zealand context had been adopted (Burton &

Paragahawewa, 2011). The way that the council had historically engaged with farmers created both an institutional and arguably also a cognitive sticking point for the organisation. It was evident that a number of council participants still wanted to engage with farmers in a manner consistent with a productivist logic, rather than a environmental protection logic. Shifting from a framing of farmers and their actions as inherently good, and trusting them to manage their land appropriately (i.e. not actively governing them) to a framing of farmers as polluters of freshwater, who could not be trusted to manage their farming operations appropriately and therefore required active governing, represented a significant change for some council participants. The desire of council staff to continue to favour that way of working with farmers constrained the organisational shift in logics that was required – creating a sticking point for the organisation.

6.4.3.2 Cognitive sticking points

A number of cognitive sticking points emerged in this case that reflected previous ways of framing and knowing that had been practiced in the organisation. Those sticking points included the persistence of a belief amongst some council staff that farmers would change their behaviour because of the introduction of new regulations. That cognitive sticking point arguably illustrated a belief in the effectiveness of command and control style approaches that NRM governing entities had previously adopted. The failure of such approaches is one of the arguments advanced in the literature (e.g. Floress et al., 2015) to support the use of more collaborative approaches to managing freshwater.

The existence of a reductionist view amongst council participants also emerged as a cognitive sticking point that constrained an organisational shift to active freshwater governing. The complex and interconnected nature of water is highlighted in the literature, including by Edelenbos and van Meerkerk (2015), as necessitating a holistic and systemic approach to its governance and management. The privileging of biophysical science arguably reinforces a

reductionist approach to problem solving and policy development. The link between these two sticking points needs to be acknowledged in efforts to overcome them. It is noted that a reductionist worldview is the antithesis of the nuanced way in which farmers know land and water, and has been reported by others such as Duncan (2016) and Thomas et al. (2020). A reductionist approach was seemingly linked to the ongoing dominance of a scientific way-of-knowing that was practiced by many regional council staff.

The multiple ways-of-knowing that council staff practiced (noted in Section 6.4.2) also created a cognitive sticking point for the organisation. As noted in Section 6.4.2.2, changes were needed within the organisation that enabled the divergent ways-of-knowing practiced by staff to be worked with, which would allow the organisation to frame the freshwater problem in a way that reflected all staff's way-of-knowing freshwater, and would also facilitate the identification of a wide range of solutions to that problem that reflect the diverse way in which individuals within the council knew freshwater.

6.4.3.3 Political sticking points

The political sticking points that emerged in this case resulted from the positions of power within local government that farmers had formally held, which appear to have supported a relatively equitable relationship in terms of power relations between farmers and the regional council. Historically the majority of elected members of the Hawke's Bay Regional Council were or had actively farmed, or were generally supportive of farmers. As outlined in Chapter Three, this had changed as a result of the 2016 local government elections when new councillors were elected whose views more closely aligned with the environmental protection logic that the council organisation needed to shift towards. While a shift at the elected member level towards an environmental protection logic did appear to have started, evidence of this occurring at the staff level of the organisation was limited, and it is argued that this was in part due to the radical renegotiation of the relationship between farmers

and regional council staff that it required. Farmer-council staff relationships had historically been based on relatively equitable power relations and council participants appeared reluctant to transition towards an environmental protection logic that required the council to actively govern, and arguably exercise power over Tukituki farmers. This created what is suggested to be a political sticking point for the organisation.

6.5 Ongoing change

The data reported and discussed in this thesis was collected in 2016 and 2017. Changes in the freshwater management and governing space have occurred since that time, and these are acknowledged as they arguably demonstrate an ongoing transition in freshwater governing.

As noted in Section 3.5.2, by 1 June 2018, all farmers within the Tukituki Catchment had to have completed a farm plan. At the time of the interviews, four farmer participants were in the process of having those plans completed, and all had engaged consultants to prepare those plans on their behalf. In June 2019, some[51] of the around 1100 required farm plans remained outstanding. Instead of taking enforcement action against them, the council had opted to work with those farmers to help them complete their farm plans because "they are making progress" (Hawke's Bay Regional Council, 2019b, p. 6). Farmers that did not comply with the requirement for a farm plan needed to apply for a regional council resource consent to authorise their ongoing use of land for farming purposes (and the discharges associated with that land use). For completeness it is noted that in June 2020 further regulations took effect within the Tukituki Catchment relating to nitrogen limits. Farmers that could not

[51] The exact number of farm plans that remained outstanding in June 2019 was not detailed in either the Council agenda item on the matter (Hawke's Bay Regional Council, 2019a), nor the minutes of the discussion relating to that item (Hawke's Bay Regional Council, 2019b).

comply with those limits (assessed at both a property and sub-catchment scale) were required to apply for resource consent to authorise their ongoing farming operations.

There have also been changes related to farm plans at the national level. In what is reportedly a world-first, farm plans will become a mandatory requirement for all pastoral, arable and horticultural farms across New Zealand (Macintosh, McDowell, Wright-Stow, Depree, & Robinson, 2021). Although mandated through a change to the RMA that occurred in July 2020, at the time of writing, regulations governing the content of farm plans and timeframes within which they must be completed, as well as the implementation process, had not been finalised and were not expected to be until the end of 2021 (Hawke's Bay Regional Council, 2021; Macintosh et al., 2021).

Another significant change that has occurred at a national level in the freshwater governing space was the recognition of the concept of Te mana o te Wai in the NPSFM20. The NPSFM20 requires that freshwater is managed in a way that gives effect to Te mana o te Wai (New Zealand Government, 2020). Te mana o te Wai is a concept that recognises the fundamental importance of water, and that protecting the health of freshwater protects the health and well-being of the wider environment. Its acknowledgement in legislation requires greater involvement of tangata whenua in freshwater management and governance, and therefore changes in the way that regional councils engage with will them in the freshwater space, which will fundamentally change the way that regional councils engage with all stakeholders in regional freshwater planning processes.

6.6 Conclusion

The findings of this doctoral research enable the following conclusions to be drawn:

- A productivist logic emerged as shaping mainstream farm management and consequently freshwater management in New Zealand – to the extent that the findings of this research reflect broader agriculture in New Zealand. The dominance

of a productivist logic in agriculture is widely recognised in New Zealand and other developed countries internationally (Burton, 2004; Burton et al., 2008; Burton & Paragahawewa, 2011; Burton & Wilson, 2006; Cullen et al., 2020; Saunders, 2016). The productivist logic of farmers has been acknowledged by others such as Thomas et al. (2019) to be both place and space/time specific, and this research has enriched understanding as to the nature of space and place specific characteristics that constitute distinctions in the productivist logic. The logic in this research was centred on land and livestock and reflected local social-cultural and biophysical characteristics of the area and farming community that can be argued to constitute farmers' identities (e.g. attachment to sheep and beef farming, strong commitment to retaining the farm in the family, community participation). The logic was evident in the practices and identity of farmer participants but also in the engagement by the local NRM governing entity with farmers.

- The productivist logic that emerged in this case had an environmental dimension that included consideration of the effects of farming activities on land and freshwater – although as noted earlier these were considered secondary to the productivist dimension of the logic. Illustration of an environmental dimension of farmers' productivist logic challenges discourse that continues to portray farmers as being solely driven by a relatively one-dimensional productivist logic. Provision of an empirical example of a more nuanced farmer productivist logic that includes an environmental dimension is a contribution of this research.
- Farmers' identities and localised good farming norms, illustrated in this case to include tree-planting and stockmanship, shape farmers' practices and are reflective of the practical/experiential ways-of-knowing that farmers practice, and the networks of which they are part. What has also been illustrated is that freshwater is a new area of farming that does not yet form a component of good farming norms,

nor is it something with which farmers associate symbolic value. Farmers are starting to consider the effect of their on-farm practices on freshwater; however, those considerations are secondary to the aforementioned productivist logic through which farmers engage in farming. This research highlights the specific nuances of farming norms (and hence freshwater management) that are also shown to be reflected in the specific characteristics of the expression of a productivist logic in farming practices (and management). These include history of farming and settlement in the area, biophysical attributes of the area, relationships with others including council staff, and involvement with the community that were illustrated as being particularly important to the Tukituki farmer participants in this case.

- Individual farmer change is illustrated as being inextricably linked with other farmers with whom they farm, socialise, and co-exist as a community. Interventions that challenge accepted ways-of-knowing, farmer identity and norms are more likely to result in incremental rather than transformational change.
- Farmers' freshwater management practices in this case were not being actively governed by an NRM entity. The governing of freshwater is a new space for NRM governing entities in New Zealand in circumstances where farmers have historically been left to manage their land as they saw fit, and improvements in freshwater achieved as a by-product of soil conservation works. The transition for an NRM entity that has historically had a relatively hand-off approach to governing farmers and engaged with farmers through a productivist logic requires transformational change within the organisation, and a fundamental renegotiation of the relationship of the organisation with farmers, and also central government. The need for change within NRM entities has been reported by others (e.g. Kirsop-Taylor et al., 2020). However, the deep nature of change required has not been illustrated and is a contribution of this research to an identified knowledge gap in the literature.

- The engagement of NRM entities in freshwater governing is shaped by institutional logics. Two logics were evident in this case – a productivist and an environmental protection logic, and a shift from one logic to the other is required as a result of regime and landscape level changes in expectations of freshwater governing. The illustration of these logics is a contribution of this doctoral research as the logics through which an NRM governing entity in New Zealand engages in freshwater governing with farmers have not been identified previously. The use of an institutional logics framing arguably conceptualises the magnitude of the shift that is required within NRM governing entities given that logics are reflective of the underpinning philosophical ideas that shape individual and organisational relationships; negotiation of meaning; and legitimation of practices to be made visible (Osei-Amponsah et al., 2018).
- NRM governing entity staff can practice a range of ways-of-knowing freshwater that frame the way they perceive the freshwater problem, and the solutions that they prefer. In this case operational, regulatory and scientific ways-of-knowing freshwater were evidently practiced by NRM governing staff. Individual self-identities and ways-of-knowing, relationships amongst NRM staff, and the logic through which staff engage in freshwater management shape how individuals respond to change, and responses are many and varied given the multitude of influences. Empirical explorations of the magnitude of change required of NRM staff as individuals has received limited attention within the literature. Highlighting the need for such change, and the potential dimensions and depth of change required is another contribution of this case study.
- Change within NRM governing entities can be constrained by institutional, cognitive and political sticking points. Examples illustrated in this case included:

- Institutional sticking points resulting from an ongoing organisational focus on biophysical science, and an organisational structure focused around disciplinary based teams.
- A reductionist approach to freshwater governing and management (arguably linked to the ongoing biophysical science focus of the organisation); and also a perception of farmers as a largely homogeneous group who will respond to regulatory intervention in a uniform manner, creating cognitive sticking points.
- Political sticking points resulting from the changing dynamics in relationships between farmers and council staff, and elected councillors.

Overcoming sticking points can require change at the individual/micro-level as well as structural and cultural change within an organisation. The use of a sticking points framing to examine processes of change within an NRM governing entity is not a widely used approach within the NRM literature and arguably helps to moderate expectations about how quickly change could be achieved (Waylen et al., 2015).

- This case has illustrated an NRM governing entity that was using fixed regulations and a technocratic, top-down approach to freshwater governing and management. This challenges the dominant discourse within the water governance literature that speaks of a shift from freshwater government to governance and may reflect particular characteristics of the New Zealand policy context and the relatively hands-off approach to governing farmers and farming that some NRM governing entities have historically adopted.
- The focus of this research at the regime level has enabled the change experiences of individual actors to be made visible. Illustrating the need for micro-level (individual) change in regime actors is a contribution that this research makes to an area of the sustainability transitions literature that is not yet well developed. Changes in the

behaviour of the regime actors studied at both the individual level (i.e. the ways-of-knowing they practice) as well as how they behave collectively as groups (i.e. farming norms) were illustrated as being needed.

- Farmers' reflection on the ongoing appropriateness of some farming practices that impacted freshwater is illustrated as resulting from a shift in broader societal views about farming – a significant, landscape level shift in public opinion about farming, that has occurred over time. Farmers have taken some time to respond to this widespread shift in public opinion, and not all farmers have responded. Transformational change in farming practices is shown to take considerable time when regime level mechanisms are not actively shaping change. In such a context, and where farmers' practices have previously not been questioned, it has taken a landscape level shift for farmers to begin to respond. Farmers responding to societal pressure has been reported by others in the farmer behaviour literature (e.g. Knook & Turner, 2020; McGuire et al., 2015). The regime level focus of this research has allowed it to illustrate the multi levels and dimensions that exist within a regime and how change on-farm is ultimately enabled and constrained not only by resistance in farming but also resistance and sticking points within the regime itself.

The insights drawn from this doctoral research and the contribution this research brings to the literature have been outlined and discussed in this chapter. This has been done in recognition of the specific characteristics of the case study undertaken and those of other research in the field. The thesis will now be drawn to a close in the conclusions chapter.

Chapter 7. Conclusions

The aim of this research was to contribute empirical knowledge to the agricultural policy field about what is shaping the governing of farmers and their freshwater management practices. The specific question that this research sought to answer was what is shaping the governing of farmers, and the impact of their practices on freshwater, in a farming catchment in rural New Zealand. In this single case study, an actor-centric approach focused on the lived experiences of two groups of regime level actors - farmers living and farming in the Tukituki Catchment; and people associated with the Hawke's Bay Regional Council, the entity responsible for freshwater governing in the catchment. Significant in the context of this case was that it was set during a sustainability transition in New Zealand that had implications for farmers and agriculture, as well as the way that freshwater was governed. Central government freshwater policy had changed, and it is argued throughout this research that the scale of change that those policy changes required of the way that freshwater governing was delivered at a catchment/regional scale necessitated a transformation in the way that both farmers and the regional council engaged in freshwater governing. What this case study explored was a "transition in-the-making" (Kohler et al., 2019, p. 18) that required a radical renegotiation of the relationship between farmers and the local NRM governing entity, as well as the renegotiation of the regional council's relationship with central government, in addition to transformational change in the way that both groups engaged in freshwater governing/management.

This concluding chapter starts by identifying the insights that have emerged from this research (Section 7.1). Reflections on the research design utilised are then discussed (Section 7.2). The chapter is then drawn to a close by a discussion about future research needs that have been made visible by this doctoral research, as well as an exploration of the policy implications of the findings of this research (Sections 7.3 and 7.4).

7.1 Insights emerging

This research explored at the micro-level the lived experiences of change of regime actors experiencing a sustainability transition. This research has made multiple contributions to the sustainability transitions, institutional logics, freshwater governing, ways-of-knowing and good farming literatures through this single case study that focused on individuals' experiences of change during a contemporary transition. Those contributions were highlighted in Section 6.6, and have made visible the following theoretical and practical insights about what is governing farmers freshwater management:

- Regime actors experience transformational change at the micro-level (individual level) in multiple dimensions in multiple ways. For example, staff of a governing entity may need to change the logic through which they engage with farmers, and also adapt the way-of-knowing freshwater they practice to facilitate communication with other NRM staff that practice alternative ways-of-knowing freshwater. This type of change is deeply personal as it involves a re-evaluation and/or shift in personal identity, and associated practice change in the taken for granted ways of doing things which likely are foundations for people's positioning in not only their workplace but also in their community. Likewise, it may also involve the need for a re-negotiation of the taken for granted ways of interacting and engaging with others as well as the knowledge base and ways-of-knowing of individuals.
- While a productivist logic emerged as shaping the way that farmers managed freshwater, in this doctoral research the logic was illustrated to be multi-dimensional and not solely focused on achieving ever increasing production, as has been reported by other scholars such as Burton (2004). The productivist logic of farmers has been acknowledged by others to be both place and space (time) specific, and this research has enriched understanding as to the nature of space and place specific characteristics that constitute distinctions in the productivist logic. The

environmental dimension that constituted part of the productivist logic evident included consideration of effects of farming activities on land and freshwater – although as noted earlier these were considered secondary to the productivist dimension of the logic.

- When freshwater management (or other new forms of management) is not central to farmers' self-identity as farmers, nor explicit in the practices or symbolic capital associated with that identity and farming norms, freshwater is managed as a secondary consideration alongside a more dominant consideration. The dominant consideration of farmers is likely to be productivist and associated with the management of biophysical, plant and animal-based resources through which visible expressions of accepted farming aptitude can be conveyed.
- Farmers do not farm in isolation – they are embedded within wider structures that profoundly condition and shape their actions, as has been reported by others. Farmers' responses to change are moderated by peers and trusted advisors with whom they share a socially constructed framework that shapes and directs their interactions. Farming practices are shaped by deeply embedded norms linked to self-identity, status and legacy that are enabled, reinforced, and adopted by/within this immediate network of influence. Farmers are also influenced by the views of broader society (a landscape level change in societal views about farming) if those views challenge farmers' identities as good farmers.
- Farmer to farmer networks, ways-of-knowing and good farmer norms enable and constrain adaption in farming practices. This confirms the findings of other scholars, such as Riley (2016) in Europe. Individual farmer change is illustrated as being inextricably linked with other farmers with whom they farm, socialise, and co-exist as a community. Interventions that challenge accepted ways-of-knowing, farmer

identity and norms are more likely to result in incremental rather than transformational change.

- Farmers' identities are intimately intertwined with farming norms. Elements of farmer identity are place and space specific which can translate into distinct types of farm systems (sheep and beef), management practices, farm aesthetics, family farming legacies, and community involvement and engagement with outside agencies.
- Farming norms can and do evolve over time. Changes in practice that align with farmers' dominant productivist logic are likely to be adopted and recognised as good farming norms more quickly than those that do not. Practices that benefit freshwater, such as tree-planting, can be framed in a productivist way but that requires governing entities to engage with farmers, and consider farming practices through the eyes of farmers whose framing is shaped by their practical way-of-knowing, localised construct of a good farmer identity, place based good farming norms, and a productivist logic, which are independent constructs but all moderated by the networks of which farmers are part.
- The realisation of changes in farmers' freshwater management practices requires change of farmers at an individual and collective level because it necessitates change in both farmers' identities, as well as good farming norms. Freshwater is shown in this research to be a new area of farming that does not yet form a component of good farming norms, nor is it something with which farmers associate symbolic value. Fundamental renegotiations in farmers' relationships with other farmers, the NRM governing entity and broader society are also necessary to achieve improvements in freshwater governing.
- The nature of change facing NRM governing entities in New Zealand associated with the introduction of the NPSFM requires a significant shift in institutional logic for

entities that have historically adopted a hands-off approach to the governing of farmers and have enabled and supported farmers by also reflecting a productivist approach in the way they engaged with farmers. The NPSFM requires NRM entities to actively govern farmers and engage with them in a way that reflects an environmental protection logic. Fundamental changes in the way that tangata whenua are involved in freshwater governing are also required. This articulation of the nature of change makes explicit the potential depth and breadth of the transition regional councils in New Zealand are currently facing.

- Institutional, cognitive and political sticking points can influence the rate and nature of change within NRM governing entities. Differences in the ways-of-knowing practiced by staff, the corporate structure of an organisation, or a lack of diversity in ways-of-knowing can all create sticking points.
- Duncan (2016) argued that a way of working with disparate ways-of-knowing must be found as it challenged constructive dialogue between New Zealand farmers and governing entities about how to achieve improvements in freshwater. This research has highlighted that these ways of working are also needed to navigate the disparate ways-of-knowing that also exist within governing entities mandated to govern freshwater in New Zealand.
- Governing entities are challenged by operating in the new space of freshwater management that requires a more proactive regulatory approach. Governing entities that have historically had a relatively hand-off approach to governing farmers are grappling with the shift that active governing of farmers' freshwater management practices requires of them because it requires change in relationships within the governing entity, between local and central government, as well as the radical renegotiation (at both the staff and elected member level) of relationships between governing entities and farmers.

- The magnitude of change required within NRM governing entities in New Zealand is suggested to be significant. It is unclear whether the necessary support (in terms of time, resources and expertise) is being provided to facilitate the organisational change arguably needed before those entities can engage in active governing of farmers. Failure to recognise and provide for this change will continue to result in timeframes for improvements in freshwater not being met, and frustration with freshwater governing and management processes. The finger has regularly been pointed at farmers (amongst others) for failing to make changes to on-farm practices to help improve freshwater quality. This research illustrates that change is also required within the very organisations that are requiring change of farmers.

Change in freshwater governing is necessitated by the sustainability transition that is occurring in New Zealand and is necessary to ensure the long-term sustainability of New Zealand's freshwater resources. Transformational change of farmers, NRM governing entities and arguably others is required. The depth of change necessary, individually and collectively, has been highlighted by this research and arguably explains why improvements in freshwater have not yet been fully realised. The process of change required is multi-dimensional, multi-level, time-hungry, complex and complicated, or as simply described by one farmer participant in this research *it's a hellova big job to do this stuff (F2).*

7.2 Reflections on research design

The aim of this research was to contribute empirical knowledge to the agricultural policy field about what was shaping the governing of farmers and their freshwater management practices. The use of semi-structured interviews as part of a single case study provided an excellent opportunity to explore in-depth the experiences of both farmers and people associated with the local governing entity, and make visible valuable insights into the challenges that participants faced in the transition in which they were embedded. Case

studies are often criticised for their low generalisability (e.g. Verschuren, 2003). This case is not free of such limitations. However, it has highlighted an issue that has until now not been well articulated in the literature – that is the need for change within local government entities charged with the task of actively governing freshwater. All regional councils in New Zealand are currently grappling with this task, as are innumerable other natural resource management agencies throughout the world, and in making visible this issue, this research has raised the question of whether similar constraints to change exist within those organisations, or whether they were peculiar to this particular case. As discussed in the future research section later in this chapter, a need to explore this could provide rich pickings for future research.

The snap-shot nature of case studies presents both advantages and disadvantages. Although not specifically selected because of it, but rather a function of when the researcher was ready to commence interviews, the time period within which the data collection was undertaken for this research was a period of rapid change and particular tension between Tukituki farmers and HBRC's elected members, as set out in Chapter Three. Conducting the interviews during this period of time will have shaped the findings that have emerged and potentially amplified the depth of feelings that were expressed. This does not make any less valid those findings, but rather makes it particularly important that the context of the case was acknowledged, as it has been. The time at which the interviews were undertaken was also characterised by a significant amount of change and uncertainty with regards to freshwater governing, which has enabled this research to provide unique insights and illustrate the plethora of factors that were shaping the governing of farmers, and the impact of their practices on freshwater in the Tukituki Catchment in the mid 2010s.

The use of semi-structured interviews provided an excellent opportunity to delve into participants' lived experiences, and in reviewing the data collected, the researcher became aware of the unique worldview she bought to the research – having lived experience of both sheep farming, and also working for a local government entity, and having been actively involved in efforts to manage freshwater. This gave the researcher familiarity with the language and ways-of-knowing practiced by both groups of participants that enabled her to explore and probe with participants farming or local government matters in an informed way that researchers without the same background may not have been able to do so. As discussed in Chapter Four, both groups of participants spoke freely and frankly with the researcher, and rapport was established relatively easily in each interview, which aided what the researcher felt was honest and in-depth discussion.

Upon reflection, the case selection process used (as outlined in Chapter Four) illustrated the practice of a scientific way-of-knowing by the researcher. The case boundary used was the geographic extent of the Tukituki Catchment – a line defined by geography and scientific realities about the way that water flows, and a boundary regularly used by regional councils. Within that catchment's boundaries, sub-catchment boundaries had also been defined by the regional council, and these were initially used by the researcher to further refine the boundaries of the case. The results illustrated that farmer participants did not identify with the Tukituki Catchment boundary or community. Farmer participants spoke of and appeared to identify with Central Hawke's Bay, as well as their local area. However, the framing or boundary of the Tukituki Catchment was not meaningful to them. Catchments and sub-catchments are units of analysis/organisation that are commonly used by regional councils and arguably reflect the scientific way-of-knowing freshwater many staff within regional councils practice. However, the fact that such boundaries delineate a grouping of people that has no meaning to the community of people to which it is applied arguably presents a constraint to change. Many farmer participants identified locations or activities that created

focal points within the community such as the local school, hall or pub. People were drawn to these locations/activities for a common purpose, and shared some identity, which raises a question about the ongoing usefulness of the use of geographic boundaries to group people together, or whether a method that utilised existing social groupings (arguably reflecting existing *social elements (RC20)* of the landscape) might be more appropriate.

The researcher's employment with the Hawke's Bay Regional Council was declared at the time the first contact was made with all research participants. This may have influenced participants' comments about the organisation, and possibly also the decision of two farmers approached who declined the request to be interviewed. Given the range of views about the organisation that were shared during interviews (i.e. both positive and negative), it does not appear that this strongly influenced the data collected. However, it is important that this is recognised as something that may have shaped the data gathered.

As noted in Section 1.5, and also discussed in Section 4.6, the researcher had 'inside' experience of both farming and working for the regional council. The researcher consequently had empathy for both groups of participants. The researcher's employment with HBRC that necessitated daily engagement with freshwater management and governance issues on-the-ground and at a practical level meant that she had her own experiences of change (or lack of change) within the organisation, and opinions about those matters. The researcher was critically aware of this, and sought to overcome this potential source of bias by undertaking thorough thematic analysis, and grounding the results presented in the data collected.

7.3 Future Research

Informed by the findings of this research, the following future research is suggested as potentially making further contributions to the areas of theory to which this research has contributed:

- Empirical research that explores regime actors' experiences of change in other NRM governing entities. As briefly outlined in Chapter Three, regional councils throughout New Zealand have adopted different approaches to freshwater management, and therefore case studies located within different regions would illustrate whether the findings of this research are applicable elsewhere. Two regions are suggested – one for the contrasting context that it would provide, and the other for the seemingly similar context that it provides. The Waikato region has a significantly higher concentration of dairy farmers than Hawke's Bay, has an established working relationship between tangata whenua and local authorities as a result of the establishment of the Waikato River Authority[52], and a freshwater management plan that was developed utilising a collaborative process[53]. It appears to present a different contextual setting to the Tukituki Catchment. Seemingly at the other end of the spectrum is the Otago region, which remains dominated by sheep and beef farming in many areas and is a region that is not recognised as having actively governed farmers, so arguably has contextual similarities to the Tukituki Catchment.
- While this doctoral research has explored the governing of farmers specifically, freshwater governing involves multiple stakeholders who practice a range of ways-of-knowing. In the New Zealand context, and as highlighted in Chapter Three, tangata whenua for example practice different ways-of-knowing freshwater. Empirical research that explores what ways-of-knowing freshwater are practiced by other freshwater stakeholders, and how those are facilitated (or not) in policy development processes would provide new empirical knowledge that could help inform new approaches to freshwater governing and management.

[52] https://waikatoriver.org.nz/about/
[53] https://www.waikatoregion.govt.nz/council/policy-and-plans/healthy-rivers-plan-for-change/collaborative-stakeholder-group/

- Freshwater governing and management in New Zealand require engagement by governing entities with a range of stakeholders, including tangata whenua. Empirical research that explored what sticking points potentially constrained change in the way that governing entities and tangata whenua engaged with each other would enrich understanding about whether sticking points within governing entities remain the same/similar irrespective of the stakeholder, or are stakeholder dependent. Empirical research that explored sticking points across local government entities would also enrich understanding of whether sticking points were organisation specific, or potentially systemic and thus a consequence (at least in part) of New Zealand's broader freshwater governing system. Identifying and understanding the interaction of sticking points at all levels of governing (ie. central and local government) would also enrich understanding about how change processes can be shaped. This was also suggested by Waylen et al. (2015) as being useful further research, but appears to remain a gap in the literature.
- Longitudinal case study research would allow regime actors' experiences of change within a transition to be explored on multiple occasions over time. Such research would inform understanding of how regime actors' experiences of change differ (or not) during various phases of a transition.
- As suggested by Duncan (2016, p. 156) new pathways to work with divergent ways-of-knowing need to be developed to move conversations between governing entities and farmers from "river talk" to "farm talk". This research has illustrated that this remains a challenge, and longitudinal case study research that explored efforts to overcome farmers' and NRM governing entities' divergent ways-of-knowing freshwater management would contribute to knowledge about how this problem could be overcome.

- Empirical research that draws on both institutional logics and identity theory and explores the day-to-day (ie. micro-level) experiences of actors experiencing macro-level change that is involved in shifts in institutional logics would help develop understanding about the nature of change required in shifts in institutional logics.
- Normative work that explores the existence of links between the conceptual framings of institutional logics, ways-of-knowing, norms and self-identity. These concepts have been drawn on in this research, and links noted in the literature between logics and identity, as well as between identity and norms. However, a theoretically informed consideration of relationships between the concepts, or whether they should continue to be utilised (as they have been to date) to explore different aspects of individuals' change experiences would usefully inform future research.

7.4 Policy Implications

The findings of this research are argued to have the following implications for policy development processes that seek to govern farmers and the impact of their practices on freshwater:

- Agricultural policy must be developed using processes that adopt a systemic approach that situates agricultural policy amongst the range of other mechanisms and means of achieving change that shape farmers. Government regulation has a role to play but should not be regarded as the only means of achieving change given the socially moderated way that changes in farmer practice have been illustrated as occurring.
- The productivist logic of farmers has been illustrated by this doctoral research to have an environmental dimension that shapes farmers freshwater practices. The persistence of a perception amongst policy writers that farmers are solely driven by productivism will unnecessarily constrain what are considered to be potentially

effective ways of governing farmers. Recognition of a more multi-dimensional productivist logic could make visible new and different opportunities to encourage change in the governing of farmers freshwater management practices.

- Agricultural policy development must acknowledge and accommodate place specific farming identities and norms because of the way these have been demonstrated to shape farmers' responses to change.
- Freshwater governing and management approaches must be nuanced frameworks that provide sufficient flexibility and adaptability to allow time and place specific contexts to be responded to, and don't treat farmers as a homogenous group that will engage in freshwater management and governing in a uniform manner.
- The scale and significance of change potentially required of both farmers and governing entities needs to be acknowledged and provided for in terms of timelines for achieving freshwater policy outcomes.
- Given the long-term nature of sustainability transitions that are required, establishing a longer-term approach to freshwater governing (ie. avoiding further changes to central government freshwater policy in the short-medium term) which provides time for change in farmers underlying beliefs and values, and those of staff within local government entities could be a worthwhile investment, and ultimately result in improvements in freshwater being realised faster.
- Projects or policy development processes can be planned to engage with/or overcome sticking points if sticking points have been identified within local governing entities. However, this would extend the timeframes within which change could be expected to be achieved which would need to be recognised in relevant policy but would arguably be more realistic.

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Appendices

Appendix 1. Interview Guides

Appendix 2. Information sheet for participants

Appendix 3. Consent form for participants

Appendix 1. Interview Guides

Question Guide for Farmer Interviews – August 2016

- Explore their history – in terms of their involvement with farming, and also with property on which they are currently farming:
    - Personal history – as an individual, and also in relation to their farm
    - Property history: How is the property operated now? What has contributed to that – both locally and at a larger scales eg. nationally and globally? Are there any key 'events' that have had a particular influence on the property and the way it it managed/operated ie. damage as a result of Cyclone Bola, market deregulation?
    - What is their understanding of the history of the property?
    - Is this property similar/typical of neighbouring/nearby farms? Why/how?
- What are some of the (other) major changes to on-farm land management practices that they have made (or if they are fairly new to the property, have been made on the property)?
    - What were the main drivers for these changes? was it economic, climate, productivity, environmental, labour? Was it driven at a local scale/level or was it more of a national/global issue?
    - When were these changes made?
    - How did the change impact their day-to-day farming operation?
    - How did they make the decision to change – did they talk to other farmers/farm consultant/seed merchant, use the internet, attend a field day?
    - How long did it take them to make the decision to make a change?
    - Was the change worthwhile/successful?
    - Did they learn anything from those change processes? Has it changed the way they have gone about making subsequent decisions about the on-farm LM practice?
- What is the last change that the farmer made to their on -farm land management practices:
    - What was the change? How did it impact their day-to-day farming operation?
    - Why did they make the change? What was the main driver? Was that driver at a local scale/level or was it more of a national/global issue?
    - How did they make the decision to change – did they talk to other farmers, use the internet etc?
    - How long did it take them to make the decision to make a change?
    - Are they pleased with the result of the change?
    - Do they think in the future they would use a similar process to make other changes to on-farm land management practices?
- If they consider all of the major changes to on-farm land management practices they have made, is there one or two key things that have driven changes?
- General views on water quality:

- Globally?
- Nationally –is a problem? How have they formed/reached that opinion? If there is a prob, what do they think should be done to address it?
- Locally –is a problem? What evidence have they used to support/develop this opinion? If yes, what/who do they believe is responsible for the problem? How/does it impact decisions they make about their on-farm land mant practices? If so, how?

Question Guide for HBRC Interviews – July 2017

Purpose of HBRC interviews:

- Changes!
- Explore HBRC interaction with farmers:
    - Identify how HBRC:
        - currently engages with farmers
        - has historically engaged with farmers
    - purpose of engagement with farmers
    - drivers of change in HBRC engagement (if changes have occurred)
- HBRC management of freshwater quality:
    - Identify how HBRC's approach to the way it manages/addresses water quality has changed
    - Drivers of that change

Areas to cover & possible questions:

- Personal history
    - Time and roles at HBRC
    - Involvement with farmers/'rural'/country
- HBRC engagement with farmers/land managers
    - How do/have you personally engage with farmers? Why?
    - How has the way you engage with farmers changed over time? Why?
    - Why does HBRC engage with farmers?
    - What is/are HBRC's current approach/es to engaging with farmers?
    - How have the approaches used changed during your time with HBRC?
    - Why do you think those changes occurred? What do you think have been some of the key drivers of those changes?
    - What do you think you/HBRC has done well when engaging with farmers? Why do you think that?
    - What do you think you/HBRC could have done better when engaging with farmers? Why?
    - What is it about HBRC that has influenced how the organisation engages with farmers?
    - In your experience/through your observations, who are some of the other people/organisations that HBRC works with that you believe shape/ influence farmers on-farm practice? Why do you think that?
    - Who are the people/organisations that HBRC seek advice from about farming/working with farmers? Why?
    - Based on your observations and personal experience/interaction with farmers:
        - Why do you think farmers have made changes to their on-farm practices (that have a positive impact on water quality)?
        - Why do you think some farmers have not made changes to their practices?
        - who do you think farmers seek advice from when considering making changes?

        - How do you think the council is regarded by farmers? Why?
- HBRC Water quality
    - What has been HBRC's overall approach to the way it manages freshwater quality? How has/did that change over your time with HBRC?
    - Why do you think those changes have occurred? What do you think are some of the key drivers of those changes?
    - What do you think HBRC has done well when changing its approach to management of freshwater quality?
    - What do you think HBRC could have done better in the way it has managed the change in the way it deals with freshwater quality?
- Who else do you think I should talk to?

Appendix 2. Information sheet for participants

MASSEY UNIVERSITY
COLLEGE OF SCIENCES
TE WĀHANGA PŪTAIAO

Institute of Agriculture and Environment

Farming and freshwater quality: A relational perspective that explores what shapes farmers land management practices

INFORMATION SHEET

Who am I?
My name is Charlotte Drury and I am a PhD candidate at Massey University, in the Institute of Agriculture and Environment. I am an extramural part-time student as I am also employed part-time by the Hawke's Bay Regional Council. I live in Napier.

What am I researching and why?
As you may be aware, the National Policy Statement for Freshwater Management (NPSFM) seeks to improve the quality and quantity of New Zealand's freshwater resources by reducing the impact that land use and development activities have on freshwater. Achieving the objectives and policies of the NPSFM will require changes to be made to all activities that have an impact on freshwater including activities such as discharges from factories and wastewater treatment plants to rivers. Land management practices can also have an impact on freshwater, and as owners of big areas of land, many farmers will need to make changes to their management practices so that the impact of their farming operation on freshwater is reduced.

Farmers do not farm in isolation but are shaped and influenced by a complex web of relationships and influences that include other farmers, markets, industry, the community, regulatory bodies and the environment. Rules and regulations, such as the NPSFM, are only one of an array of things that potentially influence farmers' land management practices. This research aims to identify and describe how the complex of influences have previously, and are currently shaping farmers' land management practices.

I will use a case study approach to undertake this research and I am focusing on two sub-catchments (the Makara and the Papanui) of the Tukituki River Catchment in Central Hawke's Bay. This is the first catchment in which the Hawke's Bay Regional Council has tried to implement the NPSFM, through the 'Tukituki Plan' or 'Plan Change 6'. This means that farmers in this catchment are the first in the region who may need to adapt and/or change their on-farm management practices to reduce the impact of their farming operations on freshwater quality. This research also aims to highlight the role (if any) of the Hawke's Bay Regional Council within the complex of influences that shape farmers' land management.

Why do I want to speak to you?
I have now commenced the main phase of data collection which will involve semi-structured interviews with around 10-20 participants. The aim of which is to develop a detailed

understanding of what shapes the on-farm management practices of farmers in the Tukituki Catchment. To do this I need to speak with farmers from one of the two sub-catchments, and/or other people who have been identified as having an influence on, or knowledge of farming in either of the sub-catchments. I would like to invite you to be part of this research because you have been identified (either by a colleague at the Hawke's Bay Regional Council, or by another person who has been interviewed) as someone who fits this criteria.

If you agree to be part of this research, what do you need to do?
If you agree to participate in this research, you will take part in one interview with me. This will be between 1-2 hours duration, and with your consent, will be digitally recorded. The interview will be undertaken at a location of mutual agreement, and I am happy to travel to Central Hawke's Bay to speak with you.

What will happen with the information collected during the interview?
The recorded interviews will be transcribed and I will use the information from them to inform my research. If I intend to use any direct quotes from the interview, I will ensure that you have an opportunity to review them for accuracy before they are included in any written material that may be published. You will not be personally identified in any published work, but you may have quotes attributed to your professional position or role ie farmer, rural professional. The audio recording and written material relating to all interviews will be stored securely for seven years, and after that will be destroyed.

What are your rights if you participate in this research?
You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used unless you give permission to the researcher;
- be given access to a summary of the project findings when it is concluded;
- ask for the recorder to be turned off at any time during the interview.

Who can you speak to about this research?
If you have any questions about this research please do not hesitate to contact either me, or one of my supervisors.

Researcher
Charlotte Drury C.Drury@massey.ac.nz 027 3225595

Supervisors
Dr Janet Reid J.I.Reid@massey.ac.nz (06) 356 9099 ext 84812
Associate Professor David Horne D.J.Horne@massey.ac.nz (06) 356 9099 ext. 84792
Nathan Heath (HBRC) nathan@hbrc.govt.nz 027 7054060

Nature of this Research
This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher named above are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher, please contact Dr Brian Finch, Director, Research Ethics, telephone 06 356 9099 x 86015, email humanethics@massey.ac.nz.

Appendix 3. Consent form for participants

MASSEY UNIVERSITY
COLLEGE OF SCIENCES
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Institute of Agriculture and Environment

Farming and freshwater quality: A relational perspective that explores what shapes farmers land management practices

PARTICIPANT CONSENT FORM - INDIVIDUAL

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I agree/do not agree to the interview being sound recorded.

I agree to participate in this study under the conditions set out in the Information Sheet.

Signature: ..... **Date:** .....

Full Name - printed .....