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Local reality and the climate change adaptation dilemma:

Beyond technical fixes and 'business as usual'

Dissertation

presented in partial fulfilment of the requirements for the degree of

Doctor of Philosophy

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I dedicate this dissertation to my daughter Lucia.

And God blessed them, and God said unto them, “Be fruitful and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea and over the fowl of the air, and over every living thing that moveth upon the earth”.

—Genesis 1:28

New Zealand begins with the sea and ends with the sea. Understand this and you begin to comprehend New Zealand and the New Zealander. The thundering surf is our frontier. And our only frontier guards, gulls and migratory birds. With justice, then, the Polynesian voyagers called the land *Tiritiri o te Moana* – the gift of the sea.

—Brian Brake and Maurice Shadbolt, *New Zealand: Gift of the Sea*

ABSTRACT

Climatic changes are being recorded and experienced and coastal communities are already adversely affected with impacts projected to intensify many times over in coming decades. Adaptation is embryonic at best and needs to take place in the face of already diverse and contested interests presenting coastal communities with a dilemma: Well-intentioned approaches dressed in the rhetoric of adaptation (as legislative and guidance imperatives, and case law) are compounding existing problems by fostering unsustainable and maladaptive development. While 'business as usual' dominates, the need for an overcoming of conventional approaches through new governance modalities has never been more urgent and will become increasingly compelling in the future.

This thesis focuses on New Zealand's Coromandel Peninsula in an ethnographic case study that underscores the need to understand the messy local factors and power networks encasing climate change adaptation barriers and opportunities. Drawing upon and combining insights from political ecology and environmental planning, and building on a framework to diagnose barriers to climate change adaptation, this research discloses an urgent need for adaptation to dismantle currently gridlocked structures and evolve from persistent technical solutions, particularly against the background of coastal erosion. The findings show that adaptation must first and foremost be addressed at the community level and be integral to creative (environmental) governance approaches. The navigational chart for overcoming barriers requires a new view of the complexities involved as part of the adaptation processes.

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wharenuī (Figure 2.2) and the Harataunga/Kennedy Bay area but also took the time to explain to me in detail the precise meaning and history of the carvings, many of which he carved himself. This experience meant a lot to me and I am very grateful for Winiata's kindness and openness. From the Harataunga/Kennedy Bay community I further thank John and Mary Hovell for their vital insights.

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1

And so castles made of sand fall into the sea, eventually¹

For each careless step we take, our species will ultimately pay an
unwelcome price – always.

—Edward O. Wilson, *Anthill*

‘Business as usual’ prevails.

—Local council spokesperson (2013)

This thesis tells the story of climate change adaptation from the perspective of those affected in a local coastal community context, draws attention to local issues, which, in themselves are problematic even in the absence of climate change impacts, diagnoses adaptation² barriers, and identifies practical pathways forward. The setting is highly contested and there appear to be neither linear nor real or

¹ Jimi Hendrix, *Castles Made of Sand*, The Jimi Hendrix Experience, Axis: Bold as Love (1967).

² The meaning of adaptation differs, depending on the discipline and context in which it is used (Adger et al., 2007; Head, 2010; Schipper & Burton, 2009; Smit, Burton, Klein, & Wandel, 2000; Smit & Wandel, 2006). Here, in line with the Intergovernmental Panel on Climate Change (IPCC, 2007d, Working Group II), adaptation comprises actual adjustments, or changes in decision environments, which might ultimately enhance resilience or reduce vulnerability to observed or expected changes in climate.

workable solutions at hand. I draw attention to and paint a picture of the dilemma of having to adapt to an unprecedented environmental phenomenon. I use the example of New Zealand's Coromandel Peninsula and how climate change will further add to the existing local challenges and disputes. In doing so, I connect the global predicament of climate change with local social dynamics. I challenge and overcome disciplinary and interdisciplinary hurdles currently hampering an understanding of how to reconcile contesting interests. I make the case for innovative approaches for addressing arguably the most difficult challenge coastal communities have ever had to face.

Despite the apparent urgency of the matter, a research approach of this kind in which local stories are set against political ecology and environmental planning practice has, to my knowledge, not been attempted before in New Zealand. This ethnographic work provides scaffolding for decision-making by identifying barriers and offering approaches to overcoming these. This work further distinguishes actionable adaptation pathways in dire need to be addressed by and on behalf of coastal communities. Local insights highlight what exactly the issues are and what needs to be done to practically address and understand pressing problems regarding vulnerability³, risk⁴, exposure⁵ adaptive capacity⁶, resilience⁷ and

³ I use the term vulnerability as combination of heterogeneous definitions. These definitions describe the sensitivity of a social-ecological system to experience potential harm resulting from exposure to factors impacted upon by climatic factors and the absence of adequate response options (e.g., IPCC, 2007d; Turner et al., 2003). In essence, vulnerability is an "aggregate measure of human welfare that integrates environmental, social, economic and political exposure to a range of harmful perturbations" (Bohle, Downing, & Watts, 1994, pp. 37-38; quoted in Handmer, Dovers, & Downing, 1999). What is important in the context of this work is that vulnerability, resilience, and adaptation are inherently linked.

⁴ Risk refers to the likelihood of harm which is largely reduced by prevention, preparedness and mitigation (Schipper & Pelling, 2006). Climate change is a key contributing factor to risk which makes the incorporation of climate change information indispensable (van Aalst, 2006). In New Zealand, risk reduction primarily lies with the Resource Management Act, whereas emergency management through readiness, response, and recovery is managed through the Civil Defence Emergency Management Act (Saunders & Beban, 2012) .

⁵ Exposure refers to "the nature and degree to which a system is exposed to significant climate variations" and resulting hazards (IPCC, 2001b, p. 373). Put simply, exposure represents the degree of physical vulnerability.

⁶ Adaptive capacity refers to a system's ability to adapt to the changing environment in which it exists. Gunderson and Holling (2002, p. 32) emphasise the importance of "maintaining options in

response options which cannot be measured or understood using conventional methods (Hinkel, 2011). In order to understand the complexity at play it is essential to acknowledge that linear and rational thinking is not appropriate, predominantly because of the uncertainty, the dynamism, the interconnections as well as the natural forces involved leading to high decision stakes associated with the choices made in the face of climate change⁸. The result is that those grappling with the issue and in the front line of adaptation reality are given the opportunity to connect the dots between contentions across “space, being, and social justice” (Moser, 2010, p. 466).

This ethnographic research goes far beyond a snapshot – it is a story in itself. A story of the past, the times we live in now and of the future. Metaphorically, this story is like the wrinkles and lines in a person’s face which can make us curious or excite or inspire us. To this effect, “to see a face”, a Māori⁹ proverb says, “is to stir the memory”, or *he kitenga kanoahi he hokinga whakaaro*. The story presented here is as much a story through the eyes of locals as it is a story of the wider social-ecological system¹⁰, as it is a story in which science plays a fundamental part. What

order to buffer disturbance and to create novelty”. In the absence of adaptive capacity a system cannot exist in a desirable state (ibid.).

⁷ Resilience refers to the capacity of a system to absorb disturbance and reorganise while undergoing change in order to retain essentially the same function, structure, identity and feedbacks (B. Walker, Holling, Carpenter, & Kinzig, 2004). It is important to note that the individual factors responsible for vulnerability and building resilience, as well as the role of adaptive capacity remain unclear (Folke, 2006).

⁸ The limits of the traditional modality of science are reached when high-level decision stakes are coupled with values in dispute, high levels of uncertainty and urgency for action. Post-normal science (Funtowicz & Ravetz, 1993, 1994) becomes effective when traditional scientific approaches and methodologies become inadequate. In the case of coastal management in particular, a paradox has arisen as decisions, despite significant uncertainty, continue to be based on traditional science (cf. Bremer & Glavovic, 2013)

⁹ Derivative from *tangata whenua* meaning “ordinary people” referring to the descendants of the country’s first Polynesian immigrants, also referred to as “people of the land” (M. King, 1985).

¹⁰ The term social-ecological system is used in this dissertation in line with the Stockholm Resilience Centre (2007) which defines social-ecological systems as systems which are “linked systems of people and nature”(para. 2). The Stockholm Resilience Centre further explains that the term signifies the importance of understanding “humans as a part of, not apart from, nature — [and] that the delineation between social and ecological systems is artificial and arbitrary”. Further, “[s]cholars have also used concepts like ‘coupled human-environment systems’, ‘ecosocial systems’ and ‘socio-ecological systems’ to illustrate the interplay between social and ecological systems. The term social-ecological system was coined by Fikret Berkes and Carl Folke in 1998 because they did not want to

does climate change mean and what will it bring to those who are connected emotionally, financially, spiritually, culturally or professionally to the coast? The Coromandel Peninsula's coastline is a risky place to settle with a variable and volatile climate and backed by steep and rugged terrain.

This story is also a story of the adaptation and climate change policy and what it means in context. Policy and legal provisions have been introduced to deal with climate change adaptation but the ability to give effect to the good intentions is not progressing in the way called for by the science community, thus rendering these provisions little more than rhetoric¹¹. Consequently, this story links not only the past with the present and the future but also the global with the local and rhetoric with reality. As such, this thesis provides an informative basis to highlight practical concerns, inform public debate and decision-making, identify barriers and opportunities, and analyse adaptation pathways that need to be charted through social change¹².

1.1 A changing world

Some of the stories reflected in this thesis are set in the past when the Coromandel Peninsula's one and only main road – the Coast Road (now State Highway 25) was still a dirt road. Symbolic road features were referred to as *devil's elbow*, *seven pound ten corner* or *windy point* and resplendent coastal holiday communities belonged to other, mostly European parts of the world. Since the 1960s in particular

treat the social or ecological dimension as a prefix, but rather give the two same weight during their analysis" (Stockholm Resilience Centre, 2007, para. 2). Environmental Planner Marina Alberti (2008) highlights that as humans transform the environments they inhabit, they create complex coupled human-natural systems.

¹¹ According to the Merriam-Webster Dictionary (2014), the term 'rhetoric' refers to either "language that is intended to influence people and that may not be honest or reasonable", or "the art or skill of speaking or writing formally and effectively especially as a way to persuade or influence people".

¹² The call to address practical social-ecological concerns and issues through research is particularly strong within the scholarly arenas of (Human) Geography, Environmental Sociology, and Anthropology (see Ingold, 2002; Moser, 2010; Murphy, 2006; Murphy, de Blij, Turner, Gilmore, & Gregory, 2005; Turner, 2005; Ward, 2005, 2006, 2007).

much has changed, both socially as well as environmentally which has resulted in reforms mainly through the Resource Management Act accompanied by local government and wider law reforms. Nonetheless, irreparable environmental degradation and a persistent change of the face of the landscape had already occurred by then and continue to this day. While there have been dramatic social, institutional, and political changes over time, the fundamental drivers of decision-making in a neoliberal world remain the same. Hence, the prioritisation of financial, social, and ecological values remains unchanged.

Much of the change and the side effects of progress and development are unintentional, such as the atmospheric modification resulting in climate change or the ill-effects that come from a hardened shoreline intended to halt erosion. Wilson (2010) makes clear, there is an unwelcome price attached to progress. It is a price we pay for being where we have come to as society. Our society has altered the atmospheric composition, has settled on land exposed to risks and continues to pursue unsustainable pathways of development. However, some of the many unanswered questions include who, ultimately, holds responsibility; what, if any, pathways are available or can be made available to build community resilience and sustainability in this era of climate change and global change more broadly; and why coastal communities or society in general should pay for those who have deliberately put themselves in harm's way?

1.1.1 A story waiting to be told

A promising way to shed light on this wicked¹³ situation is to go on a journey and tell this story through the eyes of those affected. Individuals from all walks of life

¹³ Forty years ago, fifteen years before the World Meteorological Organisation (WNO) and the United Nations Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change (IPCC) in 1988, urban planners Horst Rittel and Melvin Webber argued in *Dilemmas in a General Theory of Planning* (1973) that addressing problems wicked (or non-linear) by nature were at the heart of planning. Arguably, climate change represents such a wicked, if not super-wicked problem (cf. R. Jones, 2010; Levin, Cashore, Bernstein, & Auld, 2012). As such, climate change comprises four key features: "time is running out; those who cause the problem also seek to provide a solution; the central authority needed to address it is weak or non-existent; and, partly as a result, policy responses discount the future irrationally" (Levin et al., 2012, p. 2).

and all levels of government must be included. And, as is the case with meaningful journeys preceding the telling of a story, questions that in the beginning I did not even dare to ask were answered. This journey is also a personal account of the world I live in and what is happening around me. Over the seven years of living on the Coromandel Peninsula, I have become not only involved but have also become committed and, consequently, become part of the social fabric. My positionality, reflexivity, and the power relations I am part of, however, represent a critical disjuncture to the academic framework (Sultana, 2007). Notwithstanding, only by consciously incorporating the above, I have been able to conduct deep, meaningful, and ethical research. Consequently, this is why reflexive narrative arguably represents the most suitable writing style for this research as it allows me to “continually integrate events which occur in the external world, and sort them into the ongoing story about the self” (Giddens, 1991, p. 54).

Furthermore, by using a reflexive narrative style where appropriate, I connect the global context of climate change science with local stories, yet without suspending my own lived experience, which essentially represents my first-hand account as a member of a community shaped by a wide range of factors. Lived experience is fundamentally holistic and incorporates space and time, and the human relationships as part of and within this experience (Van Manen, 1990).

As such, my work is about the multiplicity of factors and stories contributing to the formulation of practical adaptation pathways. This is similar to a Zen archer whose target is not primarily the bull’s-eye (Herrigel, 1988). Indeed, the archer deliberately forgets about the bull’s-eye and enters the state of unconscious by fully concentrating on and perfecting the many relative factors such as stance, breathing, and motion, to name but a few. Ultimately, the result is that the target will be hit. Likewise, this story is a story of the many relative factors or the ‘little’ stories describing local reality and the climate change adaptation dilemma on *Te Tara o Te*

*Ika a Maui*¹⁴ or the Coromandel Peninsula. Striking the bull's-eye evolves almost by itself through the way the story is told and local insights lead the way. The conclusion turns into a logical consequence of the way the story is narrated.

1.2 Aim and objectives

Strive not to be a success, but rather to be of value.

—Albert Einstein

Relative to other climate change work, adaptation has received relatively little research attention (Adger, Dessai, et al., 2009; Moser & Luers, 2008; O'Brien, Eriksen, Sygna, & Naess, 2006; Pielke, Prins, Rayner, & Sarewitz, 2007). There are several areas rarely considered in studies in New Zealand and to my knowledge there are no scientific publications bringing together the complexity of what constitutes local coastal communities, highlighting the non-viability of the development path taken and giving voice to key stakeholders to identify sustainable development pathways for the future. Research on social and environmental implications of a coastal community transformation has been undertaken in Australia by Gurrán and Blakely (2007), Gurrán (2008), and Thomsen, Smith, Carter, and Mayes (2009). In the year 2010, I felt compelled to make a contribution from a New Zealand perspective which led to my Master in Research and Environmental Planning thesis in which I juxtaposed coastal community climate change stories against the background of international best practice climate change adaptation

¹⁴ In Māori mythology New Zealand's North Island is likened to a stingray whereas the thin stretch of the Coromandel Peninsula represents the barb (Parker & Stanton, 2006).

guidance (Schneider, 2010). This dissertation builds on insights gained as part of my Master's thesis and gives even greater voice to diverse representations, the contested nature of distinctive local conditions, experiences, values and understandings against the background of climate change.

A prerequisite for effective climate change adaptation requires, inter alia, having a close look behind the scenes, the tension between private and public interests, Māori and Pakeha¹⁵, the equivocal development of the coast, power and politics, local¹⁶ and traditional (environmental) knowledge (TEK¹⁷), social and ecological diversity, as well as local and central government responsibilities. Ultimately, insights need to disclose strategies for navigating more sustainable pathways before “castles made of sand fall into the sea, eventually” (Hendrix, 1967).

The aim of this research is to explore differential perceptions of climate change risks and impacts, comprehend options for adaptation, and to work out how to best reconcile divergent local needs and interests. Specifically, my research aim is to find answers to the following research question:

What stands in the way of climate change adaptation on the Coromandel Peninsula?

In answering the above question, I engage with three bodies of scholarship: political ecology theory, the planning discipline, and climate change adaptation. These three

¹⁵ Originally Pākehā refers to the early European settlers of New Zealand but today describes peoples of non-Māori and/or non-Polynesian heritage. According to Ranford (2009) the term is not an ethnicity but a way to differentiate between the historic origins – the Polynesians and the Europeans.

¹⁶ Clifford Geertz (1983, p. 75) describes local knowledge forms as a relatively organised body of thought based on the immediacy of experience, while Jan van der Ploeg (1993) refers to local knowledge as *art de la localité* which implies an intimate link with spatially specific resources and practices.

¹⁷ Traditional Environmental Knowledge (TEK) refers to long-standing insights, traditions and practices and represents a knowledge-practice-belief evolving by adaptive processes and handed down through generations by cultural transmission about the relationship of living beings (including humans) with one another and with their environment (Berkes, 2008). For the purpose of this research, because this term is generally used for indigenous knowledge and potentially excludes relevant environmental knowledge accrued by non-indigenous individuals there is a distinction between indigenous and non-indigenous.

bodies of scholarship make it possible to address the following six subsidiary objectives phrased as questions:

1. What is the nature of human-environment relationships on the Coromandel Peninsula and how do these shape climate change adaptation?
2. In what ways do political ecology and planning address or enable adaptation and what are the shortcomings of existing climate change adaptation publications? Together with objective one, this objective is addressed in Chapter Three.
3. How can local narratives be made sense of in order to overcome adaptation barriers in particular local settings? This objective is addressed in Chapter Four.
4. How can understanding of the contested nature of adaptation be deepened? This objective is addressed in Chapters Five, Six, and Seven.
5. What needs to be done to address the contested nature of adaptation and what particular issues need to be addressed? This objective is addressed in Chapter Eight.
6. How can local community reality and aspirations be taken into account in establishing future adaptation pathways?

1.3 Motivation

People don't get all the connections. They say the environment is over here, the civil rights group is over there, the women's group is over there, and the other groups are here. Actually all of them are one group, and the issues we fight become null and void if we have no clean water to drink, no clean air to breathe and nothing to eat.

—Environmental Justice Activist Cora Tucker (in Kaplan, 1997, p. 69)

My inspiration is drawn from the following three key phenomena:

1. The initial situation that unsustainable and autocratic human practices have led and are continually leading to a pollution of the global atmosphere to a point where coastal margins 'far away from everything' are exposed to the consequences;
2. The fact that social, economic and political factors are responsible for unsustainable planning, ongoing environmental degradation and unbraked pollution;
3. The consequence that, no matter how one looks at it, 'business as usual' is not an option.

The above points result in a profound conundrum for not only coastal communities on the Coromandel Peninsula but entire humanity. Arguably, we are at a point where we have enough science and cognisance providing an understanding of the above phenomena. However, what I see little evidence of is a connection of the dots, an appreciation of the contradiction between knowledge and action, a translation from rhetoric into reality. What I also see little evidence of is work that attempts to tell it like it is and call a spade a spade. Arguably, the only way of doing this is by talking to those who are affected in the real world.

A key point fortifying my motivation is that this research, by nature, can only make a positive contribution to how environmental issues are approached and dealt with. Ultimately, this work empowers stakeholders by disclosing what they can do in order to overcome barriers and move beyond 'business as usual'. This work breaks through a frustrating and disempowering wall of issues to worry about by aiming to be of practical relevance. As already indicated: to date there is no anthropological/sociological approach to connecting climate change with the local human context of this kind in New Zealand (cf. Cronin, Doody, & Greenaway, 2011).

It is also my motivation to change this by drawing attention to this situation and develop practical pathways based on local insights.

I do not intend to anticipate the local stories and the local reality as presented in the case study chapters. However, when I interviewed the local Mayor Glenn Leach for this research (2012), he confirmed the above fittingly:

I've found that while all science is there, it's not correlated. Science on its own out there might be correct but until somebody brings it all together and looks at it, it doesn't show the picture. I mean we have all this information but it is not looked at when it gets down to the level here. It all goes over the top. What I am saying is that there is no practical application based on the sciences. I said to an academic once how hopeless he was in relating his work to the people, just absolutely hopeless. We need to get that balance where we use the sciences and the social sciences and put it into practical application. Most academics say that's not their job, they're here just to state the theory. I disagree with that.

In a nutshell, my motivation is to comprehend sustainable adaptation pathways by juxtaposing the science behind climate change and adaptation in particular with policy rhetoric, social interpretations and the reality in coastal communities on the Coromandel Peninsula.

1.4 Climate change

We don't have time for a meeting of the Flat Earth Society.

—Barack Obama in a climate change speech, June 25, 2013

According to an expert assessment by the Intergovernmental Panel on Climate Change (IPCC), it is “unequivocal” that the climate system is warming and that contemporary climate change is linked to human activity (IPCC, 2007b, p. 5). The formation of the United Nations Framework Convention on Climate Change in 1992 with 194 parties (as of 2011) reflects not only concern over the consequences of increasingly extreme and unprecedented weather but also the acceptance that climate change is already having and will increasingly continue to have severe consequences (Adger, 2006; IPCC, 2007d; MAF, 2008; Nottage, Wratt, Bornman, & Jones, 2010).

In 1987, at the Climate Institute’s first conference on preparing for climate change (see Climate Institute, 2010), climatologist Steve Schneider compared climate forecasting with gazing into a very dirty crystal ball. “The tough judgement to be made”, Schneider (ibid.) accentuated, “is precisely how long to clean the glass before acting on what we think we see inside” (cited in Tangle, 1988, p. 18). 27 years on, and having passed humanity’s safe operating space (Rockström et al., 2009), scientists lay predictions of severe and harsh effects as a result of continuous and unabated greenhouse gas emissions on the line (Trenberth, 2011). These predictions may have borne fruit when considering the recent extreme events such as Typhoon Haiyan, the strongest tropical cyclone ever recorded at landfall at 314 kph in November 2013 (The Guardian, 2013), Superstorm Sandy causing US\$ 68 billion in damage in October 2012 (PlaNYC, 2013), or Hurricane Katrina in August 2005 as the costliest and one of the most deadly hurricanes to ever make landfall (Knabb, Rhome, & Brown, 2005). Indeed, it is only now that scientists are able to make statements such as the following with regard to the recent “[W]ould these events have occurred if atmospheric carbon dioxide had remained at its pre-industrial level of 280 ppm”? NASA’s response is “almost certainly not” (2010, p. 5).

1.4.1 From global to regional

Climate change has become the most plausible explanation for increased climate-related catastrophes the world is experiencing (Munich RE, 2010). New Zealand's Ministry for the Environment anticipates a range of climate change associated shifts while New Zealand's National Institute of Water and Atmospheric Research highlights that potential impacts are likely to be substantial without adaptation (MFE, 2008a; NIWA, 2008b).

In a way, climate change and its effects represent a form of environmental colonialism because, so far, the least industrialised nations are most affected (Crate & Nutall, 2009). Those with an overall low responsibility for what is happening in the global commons, unable to diminish changes through mitigation¹⁸, happen to be in some of the most climate-sensitive parts of the world. While this is primarily the case for what is considered to be the 'developing'¹⁹ world', New Zealand is, nonetheless, highly climate sensitive due to being an island nation and having the majority of its infrastructure and settlements on coastal margins. These margins are by nature climate sensitive and consequently vulnerable (Kirch, 2005; Steffen et al., 2004). Arguably, given that New Zealand is a 'developed' country, it is in a position to effectively mitigate climate change and adapt simultaneously. "Neglecting any side of the challenge of integrating mitigation and adaptation", Susanne Moser (2012, pp. 173-174) writes, "the science, the policy landscape and history, and those who will need to support and be affected by climate policy – is bound to lead

¹⁸ Climate change mitigation is a decrease in the intensity of radiative forcing with the aim of reducing the effects of climate change (IPCC, 2007c). The purpose of mitigation is a reduction in greenhouse gas concentrations while the purpose of adaptation is to increase a tolerance to climate change effects. Mitigation efforts aim to slow climate change by reducing the amount of greenhouse gases emitted globally, or increasing the capacity to capture emissions in natural sinks, such as forests, or through technological innovation. Leading mitigation approaches include the establishment of carbon markets, mandated emission standards and energy efficient policies, and voluntary initiatives to move towards a low-carbon economy. Even though some of these approaches are at relatively early stages of development, adequate governance safeguards should be put in place from the outset to ensure that they can best achieve their objectives (Transparency International, 2011, p. xxix).

¹⁹ According to The World Bank (2012), countries with a Gross National Income (GNI) of up to US\$ 11,905 are classified as developing countries.

to further delays, tradeoffs, and ultimately, as John Holdren²⁰ would say, greater suffering". Moreover, key sectors of New Zealand's economy, including farming, forestry and tourism are highly vulnerable to climatic shifts representing not only interconnectedness but also interdependence (Dynes et al., 2010; Hall & Higham, 2005; Howden et al., 2007; Reisinger, Mullan, Manning, Wratt, & Nottage, 2010; Watt, Stone, Hood, & Manning, 2011). My focus on coasts and livelihoods of communities on the Coromandel, dependent on the changing natural attributes, exemplifies the above environmental colonialism Crate and Nutall (2009) refer to.

1.4.2 From regional to local

Climate change not only increases the vulnerability in such coastal margins through altered weather patterns and an increase in severity of weather events (IPCC, 2007d; MAF, 2008; MFE, 2009a; Rahmstorf et al., 2007), it ultimately aggravates unsustainable practices, existing social, economic, political and environmental trends, problems, issues, contestations, and challenges. According to the Institution of Professional Engineers (IPENZ, 2012, p. 15) New Zealand's policy framework is "inconsistent, incomplete and ineffective to adequately reduce New Zealand's exposure to natural hazards²¹" and blames a "lack of overall guidance and direction" for an overall elevated level of vulnerability. Metaphorically, if matters are already marginal, it does not take much for the straw to break the camel's back. Here, coastal communities represent the camel and climate change is the straw.

²⁰ According to John Holdren, U.S. President Barack Obama's science advisor, there are three choices in dealing with climate change: mitigation, adaptation, and suffering. Holdren (2008, p. 430) highlights that "[a]voiding increases in suffering that could become catastrophic will require large increases in the efforts devoted to both mitigation and adaptation".

²¹ Given this thesis's focus on climate change, I use the term natural hazard in line with the World Meteorological Organization (WMO, 2012, para. 1) which defines natural hazards as "severe and extreme weather and climate events". Such hazards become disasters when lives and livelihoods are severely affected (ibid.). Given that development pressures frequently stand in the way of hazard risk mitigation (Glavovic, Saunders, & Becker, 2010), and the unequivocal anthropogenic influences are now distinguished from natural influences (IPCC, 2007d), the naturalness of hazards and subsequent disasters must be put into question. Cannon and Müller-Mahn (2010) further underline the importance of an examination of the conditions leading up to a disaster. As such, the conditions determining vulnerability are socially constructed, not least because climate-related hazards are becoming both more frequent and more intense (Coumou & Rahmstorf, 2012).

The Millennium Ecosystem Assessment (2005) underlines the connection of the global with the regional with the local and vice versa by pointing out the significance of local ecosystem services and support on which not only local human societies, but also globally interconnected economies depend. In other words, there is interdependency. Consequently, an understanding of the wide range of climate and non-climate factors at play, as well as a recognition of multilevel governance²² and decision-making, becomes vital in dealing with the multidimensional dilemma of climate change adaptation (Fidelman, Leitch, & Nelson, 2013). The key point here is that, independent of the nature of climate change and its implications on governance and decision-making as part of adaptation, the implications of climate change, together with the associated risks, directly and immediately affect local communities and individuals (Paavola & Adger, 2006). Adaptation to climate change and the factors hampering, stalling, or diverting the adaptation process, is a social aspect far from understood. Why, when science warns of severe consequences and policy appears to be robust, does 'business as usual' remain the order of the day? Addressing adaptation barriers closely linked with sustainable development fundamentally reveals who will be and who is already affected by climate change. The question remains how vulnerable local communities are and what options do they have available to be resilient or 'bounce back' from impacts or disturbances and adjust to a changing environment? Instead of to 'bounce back' would it not be more appropriate to transform into a more desirable state? Arguably ideally, such a more desirable state (cf. Folke, 2006; Gallopín, 2006; B. Walker et al., 2004) is defined by antifragility. The resilient, Nassim Nicholas Taleb (p. 3) writes, "resists shocks and stays the same; the antifragile gets better".

²² I use the term governance as a set of decisions, processes, institutional structures and mechanisms, including the division of authority and underlying norms, involved in determining a course of action (cf. Moser, 2009b).

1.4.3 Local reality

For the time being, the main and most clearly experienced impact coastal margins are experiencing is increased erosion and the prospect of more intense and frequent extreme events (Field, Barros, Stocker, & Dahe, 2012; Moser, Jeffress Williams, & Boesch, 2012). Erosion is directly related to sea level rise, changes in storm patterns, unprecedented weather extremes, and also altered wave patterns and height (Schuerch, Vafeidis, Slawig, & Temmerman, 2013). What will happen to beachfront properties and the investments made as risks are growing, what about wider cultural values, and, why should those with power and influence be subsidised for short-sighted self-interest as impacts increase and denial or apathy no longer represent loopholes?

Coastal margins on the Coromandel Peninsula in particular, face increased unpredictability, uncertainty and unquantifiability of impacts (EW & TCDC, 2003; NIWA, 2008a, 2011). As it stands, over 75% of the Peninsula's beaches and dunes have already been developed with over 70% of the development set back less than 100 metres from the sea (ARC, 2004). Approximately \$1 billion of real estate is situated in the Coromandel coastal set-back zone (Hunter, Burkitt, & Trangmar, 2010). Both Māori and Pakeha alike are already seeing and experiencing changes in weather patterns, although a connection with climate change mostly remains absent. Independent of whether local experiences and observations are linked to climate change or not, what is decisive is that the ramifications of unprecedented change are no longer something that may happen sometime in the future. It is here, it is now, and it is real – despite *increasingly* (McCright & Dunlap, 2011, p. 1171) being disavowed in the course of climate change denial promoted by “fossil fuel (and other) industry organizations (e.g., Freudenburg, Gramling, & Davidson, 2008), conservative think tanks (e.g., Oreskes & Conway, 2010), contrarian scientists (e.g., Lahsen, 2008) and conservative (Republican) politicians (e.g., McCright & Dunlap, 2010)” (McCright & Dunlap, 2011, p. 1163).

1.4.4 Local wisdom

As it stands, there is little information available to guide adaptation and climate change decisions, and to identify collaborative adaptation pathways (Adger, Dessai, et al., 2009; Adger, Lorenzoni, & O'Brien, 2009; Moser, 2009b; Moser & Ekstrom, 2010). From a social perspective, the field of climate change adaptation, certainly in New Zealand, remains to a large extent a dark horse. So who better to work with, talk to, and ask, than those who should ostensibly know best because they are in the frontline of local adaptation reality? Stories from the Coromandel Peninsula seem predestined for an examination of complex adaptive systems²³ in the face of “multi-hazard phenomena including the simultaneous occurrence of sudden-onset hazards and creeping changes” likely to occur as a result of climate change (Birkmann, Garschagen, Kraas, & Quang, 2010, p. 188).

Accordingly, there has arisen a persuasive need for local climate change stories to be investigated and adaptation pathways to be identified. If we are to not only understand impacts and challenges but make decisions on how to go forward, we need to place climate change into the real-world context of multiple stressors, exposure and vulnerabilities, and the “actual capacity of communities, businesses, and local and state government institutions to anticipate and respond to rapidly unfolding changes in the physical and social environment” (Moser, 2010, p. 467).

Apart from a practical perspective there are sound moral²⁴ and ethical reasons to investigate the implications of climate change paired with local experiences and include insights into the role and potential of local understanding when moving into the future. As mentioned, the coastal communities at the front line of climate change impacts hold very little responsibility for climate change itself. This,

²³ Complex adaptive systems are characterised by a high level of interacting components able to learn or adapt. Such systems are elementary within many particularly non-linear contemporary problems, including resilience and sustainable development (e.g., Ahmed, Elgazzar, & Hegazi, 2005; Folke et al., 2002; Holland, 2006).

²⁴ Stephen M. Gardiner and Lauren Hartzell-Nicholls (2012) describe climate change as a “perfect moral storm” due to being a global phenomenon, having a “tragedy of the commons structure” and the fact that vulnerabilities, at least in the short-term, are skewed.

however, does not alleviate an obligation to reduce the consequential vulnerability accompanying climate change through the identification of adaptation pathways. Research that is devoted to the needs of local communities addresses an ethical responsibility to make a practical contribution. The moral aspect is further confirmed in the initial situation of climate change representing a socially constructed “monumental problem for humanity [-] invested with moral significance and emotional weight” (Onuf, 2007, p. xiv). Consequently, a promising way to do justice to this “monumental problem” (ibid.), is by scrutinising the issue from a wide range of vantage points. These include indigenous and non-indigenous²⁵ insights based on local and/or traditional environmental knowledge as well as social memory, and growing scientific and technical knowledge and understanding.

In order to become resilient, moreover to “get better” (Taleb, 2012, p. 3), local wisdom and insights are vital. Such wisdom is not interchangeable or universal but is situated in time and space: what is more, it is highly context-specific. The story of climate change adaptation on the Coromandel, like any story drawing on local wisdom, insight, and understanding, “sits” in place and is inherently linked with a “sense of place” (Basso, 1996, p. xiv). As such, Basso (ibid., inverted commas in original) explains, “senses of place also partake of cultures²⁶, of shared bodies of ‘local knowledge’²⁷ with which persons and whole communities render their places meaningful and endow them with social importance”. This does not imply that local knowledge is the quintessential element in adaptation (Kelman & West, 2009). Like any form of knowledge, local knowledge and its applicability for adaptation has its strengths and weaknesses (Lebel, 2012). However, if adaptation guidance and

²⁵ Challenges surrounding the definition of indigenous knowledge are discussed in McGregor (2004).

²⁶ Culture is defined by “norms, values, attitudes, and symbolic representations [and is] manifest in the social connections and structures that that culture regulates – the organization of individuals into groups, their statuses, [and] their relationship to one another” (Pellow, 2003, p. 160).

²⁷ Local knowledge is practical, collective and location-specific (Geertz, 1983). Lebel (2012) highlights the risk of local knowledge becoming insufficient for dealing with unprecedented changes in climate. Nonetheless, Lebel (ibid.) further underscores, an understanding of the strengths and weaknesses of local knowledge can make possible a meaningful hybridization with scientific knowledge and hence contribute to an identification of adaptation pathways.

policy and practice are to be attended to and influenced purposefully, there is no way around a collaborative process in which first-hand environmental, political and social information from people and places is brought to the table.

Figure 1.1 shows local farmer Ray Russek explaining to me and contextualising the changes that have taken place over time from his personal perspective. This personal perspective and the ensuing local knowledge translates into problem-specific responses indispensable for a collaborative process (Lach, Rayner, & Ingram, 2005). However, as this work confirms, the “critical relationship between knowledge and power” in such collaborative processes, as identified by Flyvbjerg (2001) and Healey (2003; cited in B. Taylor & de Loë, 2012, p. 1207) has resulted in a situation in which local knowledge is invariably undervalued or even discounted.



Figure 1.1: Local longtime resident and farmer Ray Russek entrusting to me local wisdom inherently linked with a sense of place (photo by Tashiro, 2011).

1.4.5 Connecting the dots²⁸

I do not propose here to pursue any scientific contention towards the full details of climate change and its local impacts. Much scientific work has been undertaken and there is no shortage in scientific publications confirming the above (i.e. Cinner et al., 2012; R. J. T. Klein, Nicholls, & Mimura, 1999; Nicholls & Cazenave, 2010; Parmesan & Yohe, 2003; Parry, Canziani, Palutikof, Linden, & Hanson, 2007). Rather, I connect the dots between climate change and local adaptation reality. In doing so, I explore differential perceptions of climate change risks and impacts, comprehend options for adaptation, work out how best to reconcile divergent local needs and interests. Most importantly, I provide tangible answers to the questions of why rhetoric and reality do not match, and precisely why there remains a persistent adaptation deficit. The bull's-eye becomes an identification of what must be done in order to prepare coastal communities for a climatic “period of consequences” (Moser, 2011, p. 33). After all, without adaptation, coastal communities will not be able to reduce the negative impact from climate change or even take advantage of possible benefits resulting from an altered climate (e.g., Burton, Kates, & White, 1993; Parry et al., 2007).

1.5 The Coromandel Peninsula

The peninsula was still beautiful, stunningly so in places, and this was the focal point for promoting and selling the subdivision schemes. But it was no longer a base purely for the kinds of low-impact camping and baching²⁹

²⁸ Coincidentally, Bill McKibben initiated a project called Connect the Dots in 2012 with the aim of raising climate change awareness and showing the “human face of climate change” (www.climatedots.org).

²⁹ A bach (pronounced ‘batch’) is a New Zealand beach house or holiday home. Baches are an iconic feature of New Zealand’s coastal communities symbolising a beach holiday lifestyle that started

—Michael King, *The Coromandel*

The shadowy tents beneath the pines
The surfboards and the fishing-lines
Tell that our life might be
One of simplicity...
So children burn the seastained wood
And tell the present as good
Knowing that bonfires are
Important as a star

—M.K. Joseph, *Mercury Bay Eclogue*

The Coromandel Peninsula is New Zealand's favourite holiday destination (Davison, 2011). It is here that the highest number of holiday homes in the country is found (Statistics New Zealand, 2008). Anybody who has been to this part of New Zealand knows why. Magnificent sand beaches, crystal clear water, native bush covered hills, and a seeming remoteness and wilderness despite being only a couple of hours drive³⁰ from the main centres of Auckland, Hamilton or Tauranga. The steep and rugged terrain and its geographical setting give the impression that the

becoming accessible to the middle-class since the 1960s (Phillips, 2009). 'Baching' refers to staying in a bach.

³⁰ The roads on the Coromandel Peninsula, mostly scenic drives along the coast, are so steep and winding that a trip by car from Thames at the south-western 'gateway' to the Coromandel to Cape Colville at the northern tip, despite being only a bit over 100km takes about 3 hours, half of this time is spent driving on unsealed roads. The quality of roads in the region is inversely proportional to the gasp factor – the more beautiful the scenery, the more harrowing the drive (Let's go, 2011).

Peninsula is locked in time. However, the Peninsula's physical geography is also the reason for why this part of New Zealand is a challenging place to be. A New Zealand Insurance Council Executive (2012) interviewed for this research outlines the local geographical context as follows:

The Coromandel Peninsula is an interesting place in the way it juts out into the sea and we all know that cyclones and storms come from the sea. Then you have this dramatic landscape ... straight up. You get very high volumes and speed of water moving down those valleys, you've got an element of deforestation, the farms have really denuded the critical areas and destabilised the land. I think that that makes the Coromandel a very good focal point for what is happening because it is the beginning of what will happen to less dramatic landscapes. We will see an increase in really heavy rainfall in that area. Dramatic rainfalls ... one of the two most dramatic rainfalls I have seen in my life was actually on the Coromandel: everything flooded and it was just this wall of water coming from the sky. It's certainly a very high risk area.

It is fair to say, that because things are the way they are, (certainly from a geographical standpoint) this part of New Zealand is not only vulnerable to climate change but has retained its overall naturalness with a forest covered range and human settlements confined to the fluvial deltas representing the only flat land available.

Nonetheless, as Figure 1.2 conveys, this is the reason why urban holiday makers seeking tranquillity and relaxation flock to this part of the world. In essence, many parts of the Coromandel still represent a hidden "gem within the region" (regional council Project Manager, 2012, pers. comm.) and the above is, ultimately, also what has brought me to the region, why I stayed, and why I began calling this part of the world home. Also, there is the Peninsula's reputation of being tranquil and laid-back. This distinction goes back to the 1960s. Artists, craftspeople and those seeking to withdraw from a conventional lifestyle, or, for the lack of a better word

'hippies' came to this part of New Zealand to be 'away from it all' in sub-tropical climate. Those days resulted in communes, retreat centres and alternative living situations. This is an image very much alive in people's minds when they think of the Coromandel.



Figure 1.2: An urban dweller's dream: the end of a summer's day on one of the few remaining largely undeveloped easily accessible beaches on the Coromandel (photo by author, 2012).

The Coromandel Peninsula as defined here is the peninsula stretching from Cape Colville in the north to Whangamata as the southernmost community part of this research. While the area of the Coromandel Peninsula geographically stretches as far as Mount Te Aroha, a decision mainly based on the scope of this research was made to draw an imaginary line between Whangamata and Thames. This represents more the geographical and not so much the political Coromandel Peninsula (Figure 1.3).

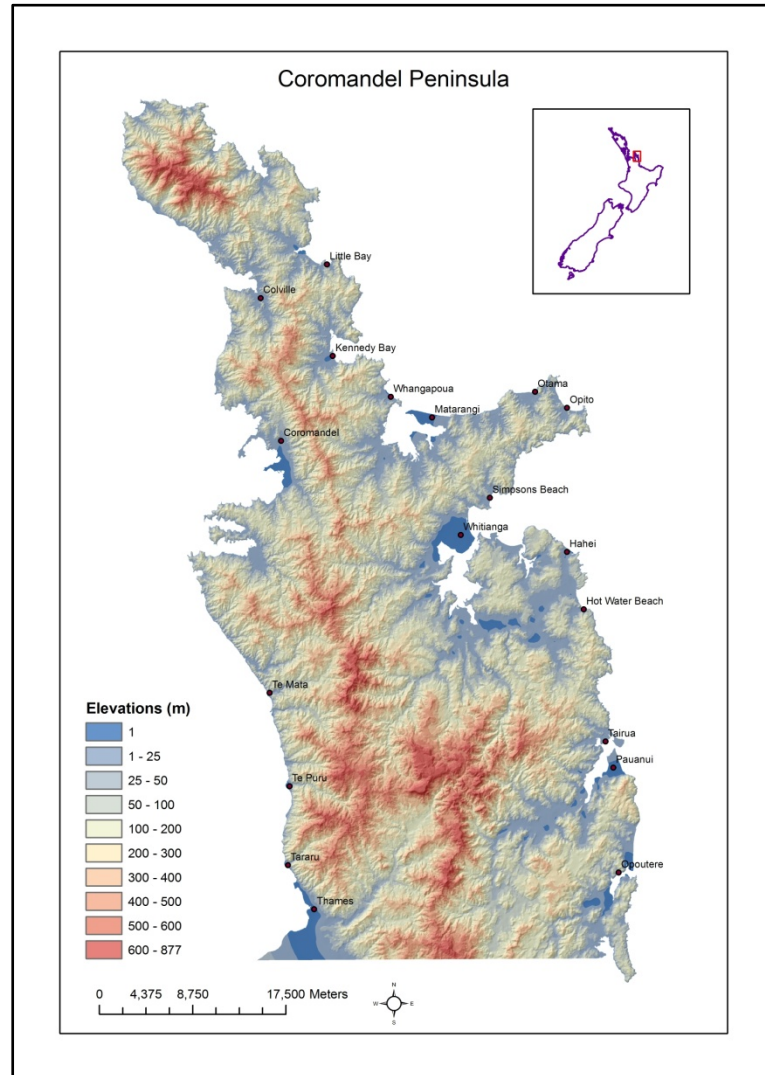


Figure 1.3: The Coromandel Peninsula showing LIDaR-generated³¹ land elevations (map produced with data from the Waikato Regional Council).

As I have personally experienced in many alluring places in the world³², it seldom took long before the fiscal value of such places was realised, bringing with it transformative change, development and the associated impacts. While remoteness, tranquillity, and an ‘away from it all’ feel can still be found on the

³¹ LIDaR is a remote sensing technology which illuminates a target with laser light and analyses the backscattered light (Cracknell & Hayes, 2007). An exceptionally high resolution makes it possible to simulate changes in the coastal zone. Such coastal changes including sea level rise are, for example, monitored by NASA’s Airborne Topographic Mapper (NASA, 2012).

³² I have personally witnessed transformative change to coastal parts of New Zealand, Greece, South Africa, the Caribbean, Italy, Spain, France, Hawai’i, and Australia in less than 20 years of a conscious awareness of what is happening to my environment. For New Zealand, this change is described in *Castles in the Sand: what’s happening to the New Zealand coast?* by Raewyn Peart (2009).

Coromandel and there are still people who live alternative lifestyles, things have changed very much as urban well-doers have increasingly bought up the Peninsula in an attempt to own a slice of paradise. The reputation of the Coromandel as getaway continues while simple coastal communities have been completely transformed over a comparatively short time period. As the coastline has increasingly been developed, coastal land value kept rising, leaving these places affordable only to a few who now commonly own precious ‘castles in the sand’ (e.g., Figure 1.4).



Figure 1.4: An example of a “castle” in the sand not far from a “falling into the sea” (Hendrix, 1967) at Whangapoua on the Coromandel’s East Coast (photo taken by author, 2011).

Despite tangible scientific evidence on which climate change projections are based, exposed properties such as beachfront mansions remain a form of expression of wealth, status and a symbol of lifestyle only few can afford – not only on the Coromandel Peninsula or New Zealand but throughout the western world and elsewhere too. For those who do not have the luxury to choose where their house

or property lies and who have no alternatives because their home happens to be exposed, the additional vulnerabilities brought by climate change significantly add to the already existing challenges of economic marginalisation, discrimination and land encroachments.

Using the Coromandel Peninsula as the nation's holiday home capital, I describe how not only our climate but also coastal development continues to undergo unprecedented change. This change comes in the shape of residential canal developments (Whitianga and Pauanui Waterways), the disappearance of affordable coastal campsites and the recent banning of so-called freedom camping, exclusive gated estates (The Glades, Matapaua Bay, Pauanui Lakes Resort, Mahakirau), high-end golf courses (The Dunes, Matarangi (Figure 1.5), The Pines and The Lakes, Pauanui, Tairua Golf Club) and uniform apartment blocks (Whitianga, Whangamata). Traditional coastal communities have become holiday destinations catering for affluent urban dwellers. Traditional kiwi³³ baches were and continue to be displaced by holiday houses constructed as close as possible to the shoreline.

³³ Kiwi is a unique colloquial term for New Zealanders commonly used as self reference deriving from the endemic kiwi bird (New Zealand Immigration Service, 2005).



Figure 1.5: Coastal transformation on the Coromandel catering for urban well-doers (photo by *The Dunes Golf Resort Matarangi*, 2013).

The transformation coastal communities have undergone becomes clear from an excerpt published in a book about Whitianga little over 60 years ago. Alfred Lee wrote the following (p. 3):

[E]xcellent camping facilities are available in the township and along Buffalo Beach, a two-mile stretch of gleaming white sand, which in itself is a delightful pleasure ground. [Something] that only those who go ‘Whitianga’ way treasure....

Camping facilities have now been reduced to an out-of-sight campground behind rows of beachfront properties at the northern end of Buffalo Beach and the “two-mile stretch of gleaming white sand” is now backed by “rock protection works” (Figure 8.3) continually costing³⁴ local ratepayers “about \$120,000 per annum” in

³⁴ Apart from already incurring economic costs associated with natural hazard management, New Zealand’s Ministry for Primary Industries specifies the costs of climate change to be possibly “significant” (MPI, 2013, section 4, para. 1). Actual economic costs are difficult to specify but will include the costs of dealing with extreme events as well as sea level rise but also the cost of taking

maintenance (EW, 2006, p. E2). To add insult to injury, the “rock protection works have led to a “loss of high tide beach” (EW, 2006, p. B10).



Figure 1.6: An interference with coastal processes: the coastal erosion situation at Buffalo Beach (Whitianga) requires long-term solutions, not only against the background of changes in climate and sea level rise (photo by Thames Coromandel District Council, 2012).

Shoreline armouring and human interference with coastal processes essentially inhibits natural flexibility (Nordstrom, 2000). By preventing natural processes such as erosion and accretion through a hardening of the shoreline the beach profile in many developed parts of the Coromandel Peninsula (i.e. Buffalo Beach, Cooks Beach, Te Mata, Tairua, Whitianga) has become narrower over time and has ultimately resulted in a long-term erosion problem. This becomes visible in a loss of high-tide beach at first. Worldwide, beaches as “unique ecosystems, are facing escalating anthropogenic pressures, chiefly from rapacious coastal development,

adaptive measures (IPCC, 2007b). Even more difficult to quantify are cultural losses including the loss of land but also the loss of amenity values.

direct human uses — mainly associated with recreation — and rising sea levels” (Schlacher et al., 2007, p. 556). Figure 1.7 shows how the human interference with the natural processes has led to a situation where beaches have become “trapped in a coastal squeeze between the impacts of urbanization on the terrestrial side and manifestations of climate change at sea” (ibid., p. 557).



Figure 1.7: Arguably well intended ‘business as usual’: the placement of ‘rip-rap’ armouring in an attempt to prevent increasing erosion along Te Mata Beach (photo by author, 2012).

Shoreline armouring is quite likely done with the best intentions in mind to prevent natural dynamics in an otherwise dynamic environment. Figure 1.7 provides an example of an inherently contradictory situation: public funds (taxes) are used to protect public assets (in this case the road) yet to the detriment of the public (beach degradation/loss).

Fundamentally, people are drawn to beaches such as on the Coromandel because of their beauty, yet in attempting to lock this beauty in time, the very reason for why people have been drawn to them becomes lost. At the end of the day, such heavily degraded beaches with immeasurable economic, biodiversity and economic value are unlikely to experience recovery in the foreseeable future (Fletcher, 2010; Fletcher, Mullane, & Richmond, 1997). This situation calls for sustainable coastline management taking a holistic approach embedded in a formal regulatory instrument, which is of timely relevance for adaptation (Marshall, Robinson, & Allen Owens, 2011; O'Connor, Cooper, McKenna, & Jackson, 2010).

1.6 Thesis overview

This section represents a ‘road map’ by providing a brief overview of the structure of the eight chapters. The purpose of this overview is to explain how the different chapters fit together in the complex process of painting a picture of coastal climate change on the Coromandel Peninsula.

1.6.1 Chapter Two: research strategy and methods

Chapter Two introduces case study research as research strategy and narrative analysis as the primary research method deployed. Advantages and disadvantages, ethical considerations and the process of data collection are discussed. The key participant identification and involvement process is explained together with the interview style and data analysis. Research assumptions are introduced and reasons behind having taken this approach are provided. Chapter Two also provides further justification for the selection of the Coromandel Peninsula as case study.

The analysis of narratives reflects on the role of the stories presented and assists in deepening the understanding of the local relevance of climate change and the contested nature of coastal development. The tools deployed for this work are explained in depth and include the analysis of both local coastal and climate change needs, interests, and perceptions (conducted by document analysis and key participant interviews), participant observation and a review of grey literature (i.e. council and professional documents/publications).

1.6.2 Chapter Three: political ecology, planning, and how to address barriers to climate change adaptation

Chapter Three explains the rationale behind coupling political ecology with environmental planning and rationalises the reasons behind the suitability of the

framework to diagnose adaptation barriers developed by Moser and Ekstrom (2010). Building on the methodology discussed in Chapter Two, I highlight why the scholarly approach and theoretical foundation make a distinct contribution to knowledge. I demonstrate how and why the political ecology perspective highlights the need to understand power structures and requires an inquiry into the political forces at play. While the main purpose of political power is to govern a wide range of social aspects such as “economic activity, social life and individual conduct ... individuals are not merely the subjects of power but play a part in its operations” (Rose & Miller, 2010, p. 271). As such, it is argued, political ecology makes it possible to grapple with the ongoing debate about the nature of the relationship between society and ecology and how this debate eventually culminates in the dilemma identified here. Also, I explain in which ways the planning discipline can make contributions to practically overcoming adaptation barriers in the real world context as part of the development of adaptation pathways. Climate change adaptation literature is drawn upon and the practical application of a framework by Moser and Ekstrom (2010), including barriers of cross-cutting importance are discussed.

1.6.3 Chapter Four: a framework to diagnose barriers to climate change adaptation

Building on the insights gained from a review of political ecology and planning contributions to climate change adaptation, this chapter advances a framework to diagnose adaptation barriers developed by Moser and Ekstrom (2010) and discusses how barriers can be overcome. This foundation is complemented by a diagnostic tool through which the reconciliation of contested interests results in learning and trust. An adaptive social-ecological governance approach, which connects political ecology and planning with adaptation barriers, is introduced. The outcome becomes that governance, actors and the system of concern are understood as inherently interconnected, power is addressed and planning becomes the main

driver for translating knowledge into action. Coupled with the creation of safe spaces, the currently persistent 'business as usual' can be overcome and climate change adaptation can be supported from a holistic and social-ecological angle.

1.6.4 Chapters Five, Six, and Seven: understanding climate change adaptation: a case study of Te Puru, Te-Whanganui-o-Hei/Mercury Bay, and Harataunga/Kennedy Bay

Chapters Five, Six, and Seven represent the three case study chapters. In these three chapters, I practically connect the insights gained from the political ecology and planning review with the framework to diagnose barriers to climate change adaptation by Moser and Ekstrom (2010) and apply the insights to the real world context. I examine each barrier and use coastal erosion as the main overarching problem affecting all three coastal communities yet with different local outcomes. In order to gain an understanding of the elusive social dimension, I let the voices of those interviewed, from all walks of life and all levels of government provide insights to the according barriers.

1.6.5 Chapter Eight: planning and managing climate change adaptation on the Coromandel Peninsula

Chapter Eight builds on the foregoing case study chapters in the way that it unifies the otherwise disparate communities. 'Understanding', as first phase of the rational decision-making process is examined on the local community level and on an individual scale while 'planning' and 'managing' take place at a regional scale. All three communities belong to the Thames Coromandel District and are therefore subject to the same policy rhetoric and decisions made by territorial and regional authorities. Consequently, legislative and policy rhetoric relevant to climate change adaptation are discussed in detail in this chapter and key barriers of cross-cutting importance are examined. Chapter Eight describes clearly the intersection of

political ecology and planning, pays focused attention to the aforementioned rhetoric-reality disjuncture, and reveals why and in what ways key barriers of cross-cutting importance play a fundamental role in addressing adaptation. Furthermore, Chapter Eight provides insights into what it will take to overcome 'business as usual' based on an adaptive social-ecological governance framework. Key informant insights reveal both where they see current climate change adaptation barriers as well as what, in their view, it will take for coastal communities to constructively move forward.

1.6.6 Chapter Nine: conclusion

In Chapter Nine, I discuss key insights identified in each chapter and explain the associated implications. This chapter presents the most important insights from what I have found. I begin with a review of the conceptual aspect of this research followed by illustrative examples. I conclude with five practical recommendations based on local needs, interests, barriers and opportunities emerged from participant insights and their structuring according to the adaptation barriers framework by Moser and Ekstrom (2010). The recommendations are divided into the short, medium, and genuinely long term. Together, these recommendations represent the lessons learned from this research.

2

Research design, strategy and method

With the pen in one's hand, narrative is a difficult art; narrative should flow as flows the brook down through the hills and the leafy woodlands, its course changed by every boulder it comes across and by every grass-clad gravelly spur that projects into its path; its surface broken, but its course not stayed by rocks and gravel on the bottom in the shoal places; a brook that never goes straight for a minute, but goes, and goes briskly, sometimes ungrammatically, and sometimes fetching a horseshoe three quarters of a mile around, and at the end of the circuit flowing within a yard of the path it traversed an hour before; but always going, and always following at least one law, always loyal to that law, the law of the narrative, which has no law.

—Autobiography of Mark Twain (2010, p. 242)

Because research method and research theory are interdependent (Keman, 1993), different approaches in their order fit different research questions in different ways. In most cases, the theory on which the research is based is introduced and discussed before the method for the simple reason that theory is the prerequisite for the development of a method. However, this does not necessarily prescribe the order in which they are introduced and discussed. Discourse analyst James Paul Gee

(Gee, 2014, p. 11) highlights the degree of flexibility within research in order to address specific issues or contexts:

... it is important to see that research, whether in physics, literary criticism, or in discourse analysis, is not an algorithmic procedure; it is not a set of “rules” that can be followed step-by-linear-step to get guaranteed results. There is no “scientific method,” even in the “hard” sciences, if by this we mean such a set of rules to follow. Rather, research adopts and adapts specific tools of inquiry and strategies for implementing them.

By no means do I intend to claim that the structural approach of discussing the research design, strategy and method before a review of the theory is in any way exceptional. However, I do argue that an understanding of my methodological approach and its strengths and weaknesses will assist in the confidence of the theoretical statements made. Further, I argue that this structuring also strengthens the honesty of the selected theory’s limitations. What is more, my approach enhances transparency, provides opportunities for critical reflexivity as well as positionality of myself as core research instrument.

Ethnography and a narrative approach as part of the case study research as my methodology and method³⁵ make possible a representation of local stories and insights and local community reality. It is important to note that my approach of telling the local story of climate change adaptation through the eyes of locals is everything but clear-cut, simple and straightforward. Gee (2014, p. 11) highlights the fact that depending on the method used, various “tools of inquiry” and different ways of applying these are relevant. The “tools of inquiry” I have used include narrative analysis and narrative interviews, participant observation and a review of

³⁵ Research strategy and research method differ in two fundamental ways from each other: research strategy is how research is conducted using a certain method and a particular style while the research method is the way observations are systemised and data is collected as well as the tools and techniques used for the collection of data (Weick, 1984). Methodology is the study or analysis of the methods used in the according field of research while the research design encompasses the research strategy and method.

relevant policies, plans and grey literature such as council and professional documents/publications. Such “tools of inquiry”, Gee (ibid., p. 11) explains, “are designed to describe and explain what the researcher takes to exist and to be important in a domain”. The “tools of inquiry” I have used therefore assist in making sense of local narratives in order to deepen an understanding of the contested nature of adaptation and how to overcome adaptation barriers. For example, in gauging how research participants understand climate change, my question was not *if* our climate is changing (to which the answer has been provided by scientific findings such as those concentrated in the various IPCC reports). Rather, I wished to find out what the significance of our climate changing is. Any answer to this approach implies that the “often extremely complex and nuanced” (Lawler, 2002, p. 242) answer must be understood within context and as part of social interpretations. Furthermore, it was important that I allowed sufficient flexibility so that the data was not to be forced into any predetermined format (as would have been the case if the theory had preceded the methodology).

The case studies shaping this research are not intended to be representative of the Coromandel Peninsula or New Zealand as a whole in their lived understandings of climate change adaptation. However, through the “tools of inquiry” found in case study research, an analysis of the dilemma of vulnerable coastal communities affected by a change in climate and its consequences became possible. The ethnographic approach chosen deploys an anthropological perspective to climate change research. As far as I am aware, in New Zealand there is not been an ethnographic research conducted from within vulnerable communities that examines the contestations, needs, barriers and the opportunities which assist in understanding why climate change is adding to pre-existing social and environmental challenges. Internationally, there remain few examples that fall into this wider category, including the first “open-ended, ethnographic approach to the question of how people perceive climate change”: *Living in Denial: Climate Change, Emotions, and Everyday Life* in Norway by Kari Norgaard (2011, p. 3); work undertaken over the years in the Arctic by James Ford, Barry Smit, Igor Krupnik and

Dyanna Jolly, Fikret Berkes, et al. (i.e. Berkes & Jolly, 2002; J. Ford et al., 2007; Krupnik & Jolly, 2002), work undertaken on cultural barriers to climate change adaptation in Burkina Faso by Jonas Nielsen and Anette Reenberg (2010); wider socio-economic and demographic changes in Mozambique by Luis Artur and Dorothea Hillhorst (2012); and research by Carla Roncoli and colleagues over the years (Roncoli, Crane, & Orlove, 2009; Roncoli & Magistro, 2000), including *Ethnographic and Participatory Approaches to Research on Farmers' Responses to Climate Change Predictions* undertaken in Papua New Guinea by David Lipset (2011) and Andean farmers by Benjamin Orlove and colleagues (2000). While the list appears to be long, in reality contributions from this field of research remain “marginal until now” (Barnes et al., 2013, p. 541). It can be said that the emphasis in ethnographic work undertaken to date is on climate change perception and, more recently, on interpretation (Rudiak-Gould, 2011, 2012). The motivation behind the research approach chosen here lies in bridging this gap and not only telling the story on the ground from the perspective of those who live, work, and/or play here, but, most importantly, identifying a constructive, tangible and practical way forward in overcoming the adaptation dilemma.

2.1 ‘Doing fieldwork’: challenges and rewards

The idea of ‘doing fieldwork’ was now planted in my mind and the seed would grow as such things always do. ‘Why should I want to do fieldwork?’ I asked a colleague. He made an expansive gesture that I recognised as belonging to his lecturing repertoire. It was used on occasions where students asked questions like ‘What is truth?’ or ‘How do you spell “cat”?’ Enough had been said.

—Nigel Barley, *The Innocent Anthropologist* (2000, p. 10)

Ethnography is a research design and represents “an approach to experiencing, interpreting and representing culture” (Pink, 2007, p. 18). Over the past four years, I have conducted ethnographic fieldwork with the Coromandel community. I have connected with Coromandel residents and those otherwise associated with this part of New Zealand against the background of climate change and what there is or may be to win or lose. As I will describe in more detail, the selection of research participants was based on recommendations from key informants about those best placed to shed light on coastal issues bearing testimony to climate change, governance aspects and future development prospects. Consequently, the narratives garnered demonstrate the complexity of why efforts to adapt to climate change are currently not working and why barriers are not yet overcome.

Together with the research conducted for my Master’s research³⁶, I interviewed a total of 57 participants. As I will also describe, however, the insights and the understanding presented here go beyond interviews, conducting fieldwork and writing. This work includes my positionality and therefore the acknowledgement that my own views play a part in influencing my epistemology first and foremost for the simple reason that I live on the Coromandel Peninsula and have therefore, over time, become part of the social fabric. Put simply, I am part of the story. Ergo, the research design underlying this dissertation is best described as deep ethnography. Deep ethnography implies “long-term immersion in a community” as well as “a variety of approaches including participant observation, semi-structured interviews [and] extensive field notes” (Bernard, 2011; Block, 2012, p. 380).

Commonly, ethnographic work comprises an ethnographic field work stage during which respondents are contacted and interviewed, while the lion’s share is made up of an analysis of the interview data and writing up (Geertz, 1973; Hammersley & Atkinson, 2007; Nanda & Warms, 2011). Consequently, a standard approach to an ethnographical study is divided into data collection (Lewis, 2003, p. 56), fieldwork

³⁶ The local climate change adaptation research I undertook as part of my Master’s research in 2009/2010 confirmed the potential and significance of place-based research. The rationale behind building on my Master’s research is explained in Chapter 1, Section 1.2.

(Arthur & Nazroo, 2003, p. 109), and the subsequent write-up stage. Such standard approaches have their place and generate valuable findings and insights. Arguably though, the researcher can become confronted with the fact that the reason behind doing the fieldwork is to collect data. Despite this being unintentional, there is an inherent likelihood of remaining an outsider³⁷, which can represent a barrier to context-specific insights and understandings. For example, having experienced local high magnitude storm events (such as the most recent floods on the Coromandel in December 2013 and again in June 2014) and having been exposed to the same or at least similar factors as those who contributed to this research results in a connection initially unrelated to data collection and standard research approaches.



Figure 2.1: Interviewing local longtime resident and farmer Ray Russek, whose forebears were among the first European settlers on the Coromandel (photo by Sues, 2013).

³⁷ Despite there being considerable debate about insider/outsider roles within anthropology (i.e., Headland, Pike, & Harris, 1990; Leigh, 2013; Sherif, 2001), including aspects of power and positionality (i.e., Merriam et al., 2001; J. Taylor, 2011) (as I discuss later in this chapter), this research has taught me the importance of aiming to be both insider as well as outsider as much as possible. A post in *Fieldnotes for the Anthropology of British Columbia, Canada* states that “irrespective of what the researcher’s origins are, he/she needs to play the role of both an outsider and insider in the course of ethnographic inquiry” (McIlwraith, 2006, para. 2). Despite my origins not being in the Coromandel, the fact that I have lived here for seven years places me in a position in which, arguably, I can attempt to be both.

Anthropologist Melissa Cefkin (2010, p. 125) highlights that “it will take *deep ethnography* to discover unknown patterns, relationships, and connections” (ibid., p. 125, emphasis added). Social geographer John Western (1996), who studied the relationship between urban spatial planning and apartheid in Cape Town, for example, has advocated for ethnographic work which goes beyond the researcher being an outsider. In demonstrating the significance of cultural competence in intervention research, ethnographer Ellen Block (2012) also emphasises the potential of deep ethnography. In *‘That’s what I see’: Enhancing AIDS intervention research through deep ethnography*, Block explores the challenge of caring for AIDS orphans and children with HIV/AIDS by deploying a deep ethnographical approach. In these cases too, the researchers attempted to see the world through the people they researched by placing themselves in their positions and living in their world, even if only for the duration of their research.

There are two researchers who have used deep ethnographic approaches which have inspired me and confirmed the value of my approach and work: Climate change ethnographer Kari Norgaard (2011) and ‘urban explorer’ and geographer Bradley Garrett (2012). Both researchers and their work only came to my attention after I had completed most interviews for this research.

US/Norwegian researcher Norgaard immersed herself into everyday life in a small Norwegian community she calls *Bygdaby*. In her book *Living in Denial* (2011), Norgaard traces what she defines as socially organised climate change denial through multiple levels, from emotions to cultural norms to political economy.

With no connection to climate change whatsoever, Garrett (2012), on the other hand, becomes an active member of an urban exploration crew and interrogates the practice from the inside out. The work produced by Garrett opens unprecedented insight into “issues of surveillance, resistance, hacking and urban community building...” (ibid., p. ix). The challenge for both Norgaard and Garrett, as for all the other researchers conducting deep ethnography, is to do the splits by remaining part of the social fabric while researching as objectively as only possible.

Such a long-term immersion in local culture requires a deliberate removal of perception filters, and prejudices or social reservations. Furthermore, deep ethnography requires the use of a variety of methods, including semi-structure interviews, extensive field notes, and participant observation, all of which I describe in the remainder of this section. As pointed out by anthropologist Ellen Block (2012), deep ethnography refers to an ethnographic fieldwork style that Clifford Geertz as the “single most influential American anthropologist of the past four decades” (Shweder & Good, 2005, p. vii) encouraged in his book *The Interpretation of Cultures* (1973).

The work done by Garrett (2012) and Norgaard (2011) confirmed for me the potential of an ethnographic approach by confirming the immeasurable value of being part of the social fabric and to include participants and encourage them to make their voices heard and be part of the actual outcome.

There is [only] one way to understand another culture. *Living* it. Move into it, ask to be tolerated as a guest, learn the language. At some point understanding may come (Høeg, 2005, p. 169, emphasis in original).

However, particularly in the context of the above quote by Danish writer Peter Høeg, it is important to note that the local social fabric of which I have become part of is predominantly white middle class. While I did aspire to understand Māori culture and glimpses into Māori culture became possible through this research such as when kaumatua and master carver Winiata Harrison took the time to explain to me the exact meanings of the carvings in the wharenui (sacred meeting house with the marae in front), or when local Māori told me their stories based on cultural values, such insights remained an exception. Section 2.8 explains in detail the contributions from tangata whenua as well as the rationale behind having sought distinct Māori insights.



Figure 2.2: Kaumatua (tribal elder) and local master carver Winiata Harrison next to one of his first carvings in the Harataunga/Kennedy Bay whareniui (sacred meeting house with the marae in front), (photo by author, 2012).

For seven years now, I have lived on the Coromandel Peninsula interacting with many research participants regularly, often on a daily basis. Key participants were given editorial influence over the work produced so as to ensure that local narratives are truly and honestly reflected in this thesis. Hence, the ethnography of this research, in many ways, goes beyond even what I described earlier as deep ethnography. Over the years, I have become embedded in the social fabric and I have started calling this part of the world home, especially after having worked locally as Technical Support Ranger for the Department of Conservation from 2007 to 2010. Over time, I have managed to garner intimate insights into not only the land and the sea but also the people who live in this part of New Zealand and who represent the Coromandel. This has resulted in some of the most precious insights. Situations that enabled such deep insights include local pub visits, surfing, hunting or fishing excursions with locals as well as regular interactions with locals through

my daughter's attendance at the Te Puru School. Over time, people have learned to trust me while simultaneously becoming curious as to what my research is all about. Consequently, they opened up and told many locally relevant stories with regards to how the local environment has changed and is changing as well as their understanding for why this might be the case.

However, the power relationship as one of a range of ethical components in academic participant engagement³⁸ should not be overlooked. According to Atkinson and Hammersley (1994), no matter how committed the researcher is to an ethical and egalitarian position, a power imbalance is inevitable. In my case in particular, being part of the local social fabric, there is a risk of the power imbalance being accompanied by a blurring of role boundaries and/or role confusion. For example, one local was very eager to participate in this research because she hoped that her story would exert influence on local council. Notwithstanding, my awareness of the initial situation and its inherent challenges confirmed for me the priority of maintaining a critically reflexive role. Reflexivity within ethnographic research means that "studies of others must also be studies of ourselves in our relationships with those others" (Davies, 2008, p. 13). Social research methods researcher Charlotte Davies quotes cultural anthropologist Bob Scholte (1969) (cited in Davies, 2008, p. 13) who emphasises both the *in here* as much as the *out there* in reflexive and critical anthropology. Scholte (1969, p. 431, emphasis in original) further the following:

Anthropological activity is never only scientific. In addition, it is expressive or symptomatic of a presupposed cultural world of which it is itself an integral part. As anthropologists, we cannot simply take this *Lebenswelt* ["life-world" / worldview] and its attendant scientific traditions for granted. We must subject them to further reflexive understanding, hermeneutic mediation, and philosophical critique.

³⁸ Further factors influencing academic participant engagement include appearance, age, culture, knowledge inequalities, social class, culture, environment, and gender (Baxter & Eyles, 1997; Hewitt, 2007; Richards & Emslie, 2000).

Garrett (2012) refers to the post World War II Chicago School, and in particular Anderson (2009), who emphasises not only the significance of deep ethnography when it comes to accessing and understanding local knowledge, but the importance for researchers to “get their hands dirty unbounded by methodological angst or neurosis” (Anderson, 2009, cited in Calvey, 2011, p. 217).

Over time, friendships with locals have developed, my daughter was born here and attended the local community kindergarten since her first birthday and I am directly affected by local culture. Consequently, I cannot remove or distance myself from this research and it is fair to say that the research has also had an effect on me. While this in itself is an important process (K. Bennett & Shurmer-Smith, 2001), there is an inherent risk in losing the necessary objectivity to produce an authoritative interpretation of the stories told and insights gained. As outlined, I have become invested in the community over time which means that I am no longer neutral or as objective as a researcher merely ‘doing fieldwork’ to collect data and move on. This position includes my association with organisations/departments such as, for example, councils, the university or certain professionals who have participated in this work. Ethnographers Paul Atkinson, Amanda Coffey, Sara Delamont, and John and Lyn Lofland (2001, p. 346) warn against the authoritative voice in the interpretation of data:

Where ethnographers endorse the radical solipsism of some versions of postmodernism, which make truth-claims a matter of choice, then it is indeed difficult to see how the ethnographer could make any claim to authoritative interpretation. His or her interpretation can only be placed alongside those of any other participant (or indeed non-participant) and, since multiple, contradictory realities can exist, there is no basis for choosing between them.

The point made by Atkinson, et al. (2001), I argue, represents more an advantage and strength than a disadvantage or weakness. After all, there is no single reality as such which simultaneously represents the core reason why climate change and

adaptation are so heavily contested. In work like this, such realities are interpreted and juxtaposed with the researcher's reality. Geographer Steve Herbert (2000) points out a fundamental irony in the critique of ethnographers making interpretative claims:

[The critique] fails to recognize that interpretive practices are central to *all* science, and that various social practices structure how data and theory are interrogated to create scientific work ... The interpretive dilemma is unavoidable and hardly unique to ethnography (Herbert, 2000, p. 558, emphasis in original).

The most promising form of overcoming the interpretative dilemma highlighted above, I have found to be through the aforementioned critical reflexivity as well as through transparency. My personal story is that I had moved to the Coromandel long before I considered conducting this research. Thus, this "ethnography [is] as much about my culture [as] the student as [it is] of the studied"³⁹ (Herbert, 2000, p. 563). For this reason, I believe that there is value in providing a brief synopsis of my own background: Born and raised in South Africa of Austrian descent, high school and undergraduate physical geography studies in Germany before emigrating to New Zealand to work for the Department of Conservation and complete first a Bachelor of Science (with Honours) degree, then a Master in Resource in Environmental Planning, followed by this PhD study. In the eyes of many locals, my background is somewhat out of the ordinary. However, I found that particularly when interviewing local Māori, my background and foreign accent⁴⁰, were by far not as disadvantageous as I was pre-warned by locals and academic advisors at University alike. My general experience is that politeness, courtesy, friendliness, straightforwardness, and a pinch of charm are the most universal connective virtues making cross-cultural connections everything but cumbersome.

³⁹ In *A Passage to England: Barbadian Londoners speak of home*, John Western (1992) contrasts his own experience as an immigrant with London's Barbadians whom he studied.

⁴⁰ A local Māori bantering with me during an interview wanted to know where I was from. My evading answer was that I lived "just down the coast". The local laughed and replied that while I may live down the coast, he could hear that I was not a "real kiwi" (2012, pers. comm.).

My own *life-world* or *Lebenswelt*⁴¹ inevitably has a bearing on how I see and describe issues (Chilcott, 1987). It is this *Lebenswelt* that shapes my thinking and, by definition, curtails neutrality. After all, if I were entire neutral, I would not be able to criticise, let alone identify the issues I describe in this thesis. Consequently, it is the *Lebenswelt* that makes it possible to make informed decisions (Becker, 1983). However, it is only fair to say that, in the context of this thesis, my *Lebenswelt* has also precipitated challenges. To date, I have not come across a fellow PhD student on the Coromandel and due to a local lack of employment opportunities for academics the level of education is comparatively low⁴². Furthermore, there is an underlying discernment of anti-intellectualism in the community that can be challenging at times. Alison Jones and Camille Guy (1992, p. 301), for example, write of “wider cultural tendencies in New Zealand of anti-intellectualism, a mistrust of theory, and – ironically – a moralistic dislike of those who challenge accepted beliefs”. In most cases, however, I have found that this challenge is reduced once locals do not see their prejudices confirmed.

Challenges, however, are part of any social structure. I argue that in small and rural structures such challenges are more likely to become apparent than in an urban and less personal environment. For some locals, for example, the fact that I was no longer doing a proper job which involved physical work, but spent a lot of my time behind my desk working on what locals consider to be a ‘greenie’⁴³ issue, was at times not highly regarded. In essence, my position as a researcher, even though I was receiving a scholarship for my work, resulted in ambivalence among some

⁴¹ While, since its inception in 1936 in *The Crisis of European Sciences and Transcendental Phenomenology* by Edmund Husserl, the term *Lebenswelt* has undergone a range of sociological interpretations (i.e. by Jürgen Habermas), I use the term *Lebenswelt* in its simple form as it refers to the concept of life being both experienced and lived.

⁴² According to the Ministry of Education (2010), the percentage of people aged 25-65 who had completed degrees in New Zealand lies at just above 17% for rural areas and just below 30% for urban areas.

⁴³ As I have explained in Chapter One, ‘hippies’ who, according to most locals are synonymous with ‘greenies’, have left a legacy on the Coromandel. In *“I’m not a greenie but...”: Environmentalism, eco-populism and governance in New Zealand Experiences from the Southland whitebait fishery*, Haggerty (2007) demonstrates that the term ‘greenie’, particularly within a rural New Zealand context, is negatively biased. From my own experience, locals do not want to be seen as ‘greenies’ and the term is sometimes even used as term of abuse, yet mostly with a pinch of salt and without being taken too seriously.

locals: In many ways, I was respected for my stamina, perseverance, and passion, but at the same time there was hesitation. However, some locals believed I was evading work, somewhat like receiving a benefit and doing something the world could just as well do without.

2.2 Combining ethnography with a case study approach

Case study research is an approach to studying and understanding a complex phenomenon within its context. In this case (the study of coastal communities on the Coromandel Peninsula) the context refers to the myriad of factors that present barriers to and opportunities for climate change adaptation. The complexity arising from the context becomes a major part of the research (Rousseau & Fried, 2001). The opening line to *The Art of Case Study Research* (Stake, 1995, p. xi) is that a “case study is expected to catch the complexity of a single case”. Collecting data within context requires an in-depth understanding of the social structure culminating in the messy local factors shaping the richness of the insights gained. Furthermore, as Willis (2007, p. 239) highlights, case study research is about “real people and real situations” and helps to “illuminate the reader’s understanding of the phenomenon under study”.

Despite case study research and ethnography representing two separate approaches, I argue here that an amalgamation based on the striking commonalities of the two makes sense for this research (c.f. J. White, Drew, & Hay, 2009). Fundamentally, ethnography represents “an umbrella term for fieldwork, interviewing, and other terms of gathering data in authentic (e.g. real world) environments” (Willis, 2007, p. 237). What is more, ethnography (verb) as well as the production of an ethnography (noun) represents the use of unstructured data to study people and social phenomena in a particular context (Hammersley & Atkinson, 2007). Consequently, the ethnographic case study approach taken here examines the processes as they occur in their context and the culture in which they

are set. Together, they represent this work's vital feature. The cultural story encasing the *how* and the *why* takes priority over the *what* or *how much* and amounts to this ethnographic case study which incorporates humanistic and scientific methods. By examining patterns, meanings, and relationships as part of the place and the case, I contextualise this unique story as part of an instrumental case study⁴⁴ and the interpretation of local meaning (c.f. Hartley, 2004).

Case study research is a wide and flexible definition of a research strategy (Cassell & Symon, 2004; Robson, 2002). It can be applied in a variety of ways which can vary greatly⁴⁵. As much as this insight is reason for caution, when properly applied, it offers a plurality of approaches loaded with potentiality. It makes it all the more important that the research questions as well as the data collection are designed precisely to do justice to the "particularity and complexity of a single case, coming to understand its activity within important circumstances" (Stake, 1995, p. xi). In addition, the precise research design must be accompanied by a preparedness for "unanticipated happenings that reveal the nature of the case" (Stake, 1995, p. 55). For example, regardless of how well I was prepared for the interviews, there was no way to anticipate how I would be received or the stories (often far beyond climate change) I would be told.

Yin (2009, p. 55) points out that within case study research "the demands on a person's intellect, ego and emotions are far greater than those of any other research strategy". Hartley (2004) adds to this by pointing out the demand of case study research in both intellectual and emotional terms due to the need to create links between theory and data collection and between data analysis and theory, making it necessary for the researcher to deal with theory and method concurrently as opposed to sequentially. In summary, an ethnographic cases study approach

⁴⁴ Depending on the aim of the research, case studies can be either intrinsic, instrumental, multiple and/or collective (Stake, 2005).

⁴⁵ Case study research can be highly structured, positivist, deductive investigation of multiple cases; it can also be unstructured, interpretative, inductive investigation of one case; lastly, it can be anything in between these two extremes in almost any combination" (Cavaye, 1996, pp. 227-228)

represents a highly versatile and pluralistic research method virtually ideal for understanding how climate change influences social processes within their unique context.

Applied ecologists Fikret Berkes and Dyanna Jolly (2002), use the term *going to the land* as the ideal mode of learning about the environment and the people. This makes it possible for locals to use their environment to underline the stories they are telling and making them even more vivid. Such observations make it further possible to see the changes community members are experiencing and what solutions are proposed or even demanded by local government. Voluntary environment-related local *working bees* such as those organised by the Department of Conservation but also the involvement at the Community Kindergarten my daughter attended for four consecutive years, or the local Farmer's Market are all social junctions where locals get together and interact with each other, exchange, test and reinforce their own (environmental) observations. The same is true for public community meetings. Such meetings, particularly after high magnitude weather events, provided additional insight into the contested nature of climate change and its effects on coastal communities. My experience was that at community meetings after substantial weather events that resulted in damage of some sort, community members were disgruntled and called for changes to be made. Consequently, a small window of opportunity for making changes (Chapin et al., 2010; McSweeney & Coomes, 2011) opened as locals were well aware of impacts. In general, this is also the time when locals attend meetings, make their voices heard and identify potential future impacts and when different views become most apparent.

Community meetings make clear the cacophony of voices and reflect the messiness, dynamics and complexity requiring an approach that does all this justice. Dyanna Jolly and anthropologists Igor Krupnik (2002) confirm that in such public fora, observations and records from community members are constantly reinforced and

tested in discussions. Such a process takes place in the absence of any planned assistance from funding agencies.

The approach chosen is further relevant for this research because it enables the use of research tools to study in depth a complex phenomenon in its real world context (Flyvbjerg, 2006; Yin, 2009). Kuhn (1987) emphasises the importance and necessity of deploying a range of such tools. In the case of this work, they not only include narrative interviews and their analysis but also participant observation and a review of relevant policies, plans and grey literature (i.e., council and professional documents/publications).

2.3 Narrative analysis

Within case study research, narrative analysis represents an approach to contextualising and examining the objective ways in which locals make and use stories to interpret climate change adaptation and in what way these stories are reflected in public policy and vice versa. The reason for using narrative analysis as a method for this study is motivated by a desire to unpack and understand, within context, what has been said. Narratives represent interpretive devices through which people represent not only themselves but also the environment in which they live or the policy rhetoric under which they work (Lawler, 2002).

An important aspect of narrative analysis lies in the acknowledgement that stories are evolving. Change is constant which forces people to not only adjust their perception but also reinterpret their environment (Koch, 1998). Thus, interpretation and perception are regarded as a form of lived reality. Furthermore, narratives are regarded as part of not only the physical environment but also the social, cultural and historical context. Consequently, climate change can be interpreted in a variety of different ways, depending on the context. For example, climate change can be understood as the result of local weather patterns of which extreme events are a

natural part, or climate change could be interpreted as the result of more natural changes, for example in ENSO⁴⁶ cycles. The actual meaning of what is happening around us is therefore, as highlighted by political philosopher Lois McNay (2000, p. 95), not inherent in what we experience but rather “the product of interpretative strategies amongst which narrative is central”. Ergo, the narratives are regarded as part of a system of knowledge, a point of origin different to facts. The difference between knowledge systems and facts, as fittingly described by Arctic social-ecological researcher Henry Huntington (2002), is akin to the difference between anatomy and physiology – knowing the parts does not tell you how they function and interact with each other in a living organism. Therefore, “[i]f we want to find out how people make identities, make sense of the world and of their place within it – if we want to find out how they interpret the world and themselves – we will have to attend to [and interpret] the stories they tell” (Lawler, 2002, p. 255). Indeed, interpretation is a factor distinguishing this thesis from other research in the field of resource and environmental planning.

Climate change represents one of the most contentious contemporary issues and a subject about which politicians, policymakers, scientists and others have defined a wide range of certainties and uncertainties. For this reason, climate change is virtually ideal for the analysis of narratives (Roe, 1994). Furthermore, the study of narrative is inherently interdisciplinary and complements what anthropologists Clifford Geertz (1983, p. 23), Paul Rabinow, and William Sullivan (1987, p. 2) define as the “interpretative turn” in the social sciences.

Sociologist Catherine Kohler Riessman (1993) describes the narrative as the organising principle for the social world enriching natural science methods proven limited for understanding social life (Bruner, 1990; Lawler, 2002; Rosaldo, 1989; Schafer, 1992). Bruner (1990, 1991) even asserts that narrative is one of the two basic ways people use to perceive the world, the other being the logico-scientific.

⁴⁶ El Niño Southern-Southern Oscillation (ENSO) is the periodic warming of the surface waters in the eastern tropical Pacific while the Interdecadal Pacific Oscillation (IPO) refers to the fluctuation in air pressure between Darwin, Australia and Tahiti (Patt, 2009).

Thus, narrative is also the basic way people use to change the world. Narrative analysis allows us to make sense of a socially constructed world and therefore does not treat stories as a means of transmitting the incontestable truth (cf. Fischer, 1998; Hajer, 1993; Roe, 1994; Stone, 2002). Stone (2002) highlights the significance of narrative research to take place within commons-problems and what constitutes the public good, such as climate change.

What remains to be answered is what makes a narrative a narrative and how is it even possible for stories to represent 'real' research? After all, a point of criticism is that narrative analysis lacks a degree of theory and scientific enquiry (Rhodes & Brown, 2005) and that there is a risk of "turning science and philosophy into literature" (Habermas, 1992, p. 226). A further possible constraint or limitation, apart from the risk of getting lost in the wealth of stories, lies in the perception of narrative as a mysterious and elusive concept, which, according to Jones and McBeth (2010, pp. 330-331) can be "too superfluous to underpin theory building, and too nebulous to facilitate the empirical investigation of policy processes and outcomes".

However, I argue here that through a conscious awareness of this risk and by adhering to the rules of what represents narrative, any potential drawback can knowingly be transformed into an advantage for research of this kind. For the purpose and context of this research, I also argue that the advantages of working with narratives clearly outweigh the disadvantages. After all, according to narrative theory, people produce accounts of themselves and the world around them that come in the form of stories making it the primary means by which information is processed, organised, and conveyed (cf. Berinsky & Kinder, 2006; Gerrig & Egidi, 2003; K. Klein, 2003). Information framed as a story affects what people remember and how this is structured as well as their opinions, for example on policies (Berinsky & Kinder, 2006). Not only do such stories mirror the world but, through language, they are also responsible for how the world is shaped (Roe, 1994). This role of language within the discursive revolution of post-structuralism in shaping

human-environment interactions and social reality has predominantly been led by Michel Foucault (Cetina, Schatzki, & Von Savigny, 2000). Foucault argued that language, or discourse, is epistemological and consequently takes up its own reality (1972). After all, it is through language that we humans are able to “‘re-present’, imagine evoke or symbolize that which is not itself present or ‘pre-given’” (J. Smith & Jenks, 2005, p. 155). What is more, the consequential patterns emerging from differences and similarities in the collection of stories make these not only “complete and entire” but make it possible to understand the logic of what philosopher Paul Ricoeur referred to as “emplotment” (1991a, p. 3). Fundamentally, unlike a chronicle, the “emplotment” inherent in narratives implies causality. For example, a chronicle in the context of this work is that “coastal processes erode the coast”, whereas a story is that “coastal processes have been interfered with as a result of development and changes in wave patterns which is resulting in coastal erosion”. Therefore, “emplotment” means that stories are understood within a causal context and elements within this context are not heterogeneous (*prendre ensemble*) (cf. Dowling, 2011).

In the subsequent sections, I reveal who participated in this ‘storytelling’ and describe why these particular participants were selected. Further, I explain the reasons for why I conducted the interviews for this research the way I did.

2.4 Participant selection

Underlying the selection of participants was the prospect of a disclosure of mismatches between policy rhetoric and local community adaptation reality. Consequently, participants were primarily selected based on the location of their property or the property they manage (beachfront property owners, campground managers, those living in high-risk areas, etc.); an identification through the local

iwi⁴⁷ manager; the sector they work in and their ties to the Coromandel Peninsula (i.e. insurance representative assigned to flood damages, road network provider assigned to the area, researchers, etc.); the role within government (e.g. hazards management, climate change guidance, planning, etc.); and, finally, their political role (climate change minister and climate change spokespersons for their according political parties). The ethical aspects of the research are discussed in Section 2.5.1. In summary, participants were identified by “snowballing” (participants made suggestions) but also based on their involvement with the issues making up the scope of this project, their affiliation with the communities selected or the geographical location of their property. Participants were contacted either over the phone, by mail or e-mail or personally (door-knocking). Importantly, the identification of research participants was not intended as a statistically valid representation of the Coromandel population. The human ethics application underlying the data collection is included in the appendix.

The participants included the following:

- Local and regional council representatives including hazard and planning managers, the present Thames Coromandel District Mayor and Civil Defence Area Manager;
- Respectively one participant from NIWA and GNS involved in climate change studies;
- A New Zealand Transport (NZTA) representative responsible for the Coromandel roads;
- Nine beachfront property owners;
- Four indigenous TEK and social memory carriers;
- Seven local environmental knowledge carriers (longtime residents);
- Three property owners affected by climate related hazards;
- A social scientist;
- A local coastal scientist;

⁴⁷ Iwi is the largest social unit in Māori populations (māori.org.nz, 2004).

- A coastal property developer;
- A New Zealand Insurance Council Executive; and
- The Labour Party and the Green Party’s climate change spokespersons.

A total of 39 participants were interviewed for this research: 35 in the year 2012 and a further four in the year 2013. Of these, a total of 25 participants were directly associated with the three case study communities: 8 from Te Puru, 10 from Te Whanganui-o-Hei/Mercury Bay, and 7 from Harataunga/Kennedy Bay. The remaining 14 participants were associated with the Coromandel Peninsula on a professional level (i.e., council representatives, NIWA and GNS representatives, the NZTA representative, the coastal scientist, the property developer, the Insurance Council Executive, and the politicians).

In 2010, the work from my Master’s thesis linked the local climate change adaption “story” from Te Puru with national and international best practice adaptation guidance. Interviews with 18 research participants associated with Te Puru were juxtaposed with key adaptation guidance insights. The aim was to identify practical measures through which adaptation guidance can assist adaptation. By drawing attention to the gap between adaptation guidance and local vulnerable coastal community reality, I was able to identify that adaptation efforts are unlikely to achieve much success as long as local voices are not given the attention required. The key finding from the Master’s research was that adaptation guidance publications need to be better aligned with local reality so that planning and decision-making processes can be more effective.

Given the relevance and the thematic crossovers of my Master’s research into climate change vulnerability in the Te Puru community for which I interviewed a total of 18 participants, I draw on key insights from my Master’s research in two ways: The insights garnered in 2010 contribute to the framing of the subcategories used for data analysis and coding (discussed in Section 2.5.3), and key informant insights are referred to where relevant. For example, the Civil Defence and

Emergency Management Area Manger Ron White provided invaluable insights with regard to community vulnerability when I interviewed him in 2010. Similarly, then Mayor Philippa Barriball, who chaired the sub-committee for local government on climate change in New Zealand at the time, provided insights that would otherwise be lost. Both key informants are no longer in the positions they were in when I interviewed them in 2010. Consequently, by drawing on insights from 2010 for the framing of the subcategories, I build on knowledge. Insights included from my Master's research in this thesis are referenced (e.g., p. 150; p. 154; p. 160). Together, insights from a total of 57 interviews are included in this thesis. The connections made in 2010 also assisted in the identification of key informants for this research. For example, a local council representative was instrumental in establishing contact with the Harataunga/Kennedy Bay community.

2.5 Narrative interviewing

I think an interview, properly considered, should be an investigation. You shouldn't know what the interview will yield. Otherwise, why do it at all?

—Errol Morris

This work is about individual accounts, insights, contestations, perceptions, ideas, courses of action and so much more. The term that describes all of the above best is 'messy'. As such, the interview technique must be flexibly focused. After all, what sense would it make to force stories into a pre-existing framework and protocols?

The narrative interviewing approach was selected and allowed for as much free narrative space as possible. This way, individual stories could unfold unrestricted.

Narrative interviewing, Kohler Riessman (2006, p. 190) writes, has the following characteristics:

The question and answer (stimulus/response) model gives way to viewing the interview as a discursive accomplishment. Participants engage in an evolving conversation; narrator and listener/questioner, collaboratively produce and make meaning of events that the narrator reports.... Narrative interviewing has more in common with contemporary ethnography than with mainstream political science interviewing practice that relies on discrete, open-ended and/or fixed-response questions.

The only structure I gave the interview process was based on six key themes identified as most relevant for this study:

- i. Knowledge of the Coromandel Peninsula's coast and ongoing development;
- ii. Perception of climate change salience;
- iii. Local knowledge;
- iv. Anticipated environmental changes;
- v. Adaptation already underway; and
- vi. Governance roles and responsibilities and future development prospects.

These themes served as guidelines as opposed to specific questions. The actual questions depended on the participants and the context of the interview and required a high degree of flexibility, as this approach did not work for all participants. Consequently, there was also no core question I asked every participant. Often even the term *climate change* resulted in insurmountable barriers that confirm the cultural context fundamental to ethnographic research. By initially framing the climate change dilemma around risk in the face of change, the interviews often yielded much more meaningful insights than if I had gone like a bull at the gate by insisting on climate change. Once risk was discussed, participants were much more prepared to talk about climate change and what the future may

hold. In the following sub-section, I explain how the interviews were conducted practically.

2.5.1 The Interview process

Prior to interviewing, the aim and scope of this research were explained. The introduction gave participants adequate time to decide whether they wanted to participate and sign the consent form or not. Participants were also asked to give their consent for sound recording. Sound recording was essential, otherwise I would not have been able to reflect the stories in the way I did and the participants' words would have been lost. The importance of sound recording when conducting research of this kind is confirmed by communication researcher Klaus Krippendorff (2004), who highlights that speech simply vanishes unless it is audio-recorded. While it would be possible to retain the core element of what was said (from memory or notes), such an account would by nature fail to reflect the exact story told by the participant. The interview process took place in accordance with the Massey University's ethics approval [MUHEC] that I obtained prior to commencing the interviews (Appendix 1).

The key political informants from the Green Party and the Labour Party as well as Harataunga/Kennedy Bay's kaumatua were asked if they would mind not being anonymous, which they agreed to before the interview process. The reason for this was that, arguably, their professional role adds weight and depth to the insights they provided. In some instances participants relinquished their entitlement to anonymity and wanted to be identified while others were very concerned about any possible risk of their identity being revealed. The latter was especially the case where participants were concerned that their insights may have future implications on decisions made by council. In order to represent all participant insights equally and fairly and protect all participants from any repercussions, all participants except the three listed above remain anonymous.

Whenever I felt that it would be appropriate and a visual image would add value to the interview, I asked if I could take a photograph of either the participant or the physical location (i.e. Figure 2.3). Often the physical location, such as a beachfront property, revealed the kind of struggle locals were having with the natural elements (i.e. coastal erosion). In all cases, locals did not mind having a photo taken, even though in most cases it meant that they had to give up their own anonymity (not that of other participants referred to), as set out in the consent form (i.e. Figure 2.1). Photographs tell their own story of people and/or situations, particularly against the background of the ethnographic research design. For example, Figure 2.3 confirms the dominating ‘business as usual’ practice and mindset in coastal development. Most people when shown a photo such as Figure 2.3 are able to relate to the fact that this property will, at some point, require protection of some sort from coastal processes. Those to whom I showed this picture appeared surprised yet very interested, which included council participants. If I had explained the situation in words, the participant would have had to imagine the actual setting.



Figure 2.3: Recent beachfront property development within the dynamic coastal zone at Mercury Bay on the Peninsula’s East Coast (photo by author, 2012).

The value of photographs is confirmed by visual anthropologist Sarah Pink (2007, p. 4), who both highlights its meaningfulness for ethnographic research and supports my experience of photo elicitation as part of visual ethnography being “inevitably collaborative” (Pink, 2008, p. 2). This ethnographic technique enabling the elicitation of information and insights is a further method I used to initiate discussion and collaboration. Basically, I presented pictures (such as Figure 2.3 or Figure 2.4) to participants and we would then discuss the meaning of the image. Photo elicitation was developed by anthropologist John Collier (1986). The value of discussing images is that information, emotions, and memories are evoked, which further “enlarges the possibilities of conventional empirical research” (D. Harper, 2002, p. 13). Figure 2.4, for example, a recent aerial photograph of Te Puru compared with an aerial photograph taken in the 1930s, puts into perspective the physical transformation of this flood delta. The comparison serves as a reminder of change over a relatively short time period and can also initiate deeper thinking about what the future might entail. Sociologist, Doug Harper (2002), explains that discussing photos as part of the interview process “connect[s] *core definitions of the self* to society, culture and history” (p. 13, emphasis in original). Indeed, the stories told by some locals, in particular those who have lived in the area most of their lives were often embellished by photographs.





Figure 2.4: A photographic comparison: Te Puru today (top) and in the early 1930s (bottom) (photos by Civil Defence, Thames).

Novelist John Berger writes that “[t]he thrill found in a photograph comes from the onrush of memory. This is obvious when it’s a picture of something we once knew” (Berger, 1992, cited in Harper, 2002, p. 13). Indeed, as I explain later in this chapter, the past has proven to be of particular importance to particularly the elderly locals. To them, photos generated memories which in turn stimulated stories.

At times, the interviews revealed sensitive information or the story I was told was out of line with my own values. For example, one key informant expressed racist views and dismissed any value in drawing on traditional environmental knowledge from Māori (p. 169). Other times, the information I was entrusted with could be potentially damaging if made public, all of which is also identified by psychologist Jean Hartley (2004). Both from an ethical research perspective as well as from my perspective as local community member, I found it very important to have an awareness of the trust participants confided in me. After all, the interview process made it possible to experience a rare privilege: the opportunity to see and understand the real life and work environment of those interviewed, many a time “beyond presentational rhetoric and behavioural shows” (S. Barley, 1990, p. 241). Participants with whom I met regularly or others who already knew me would have had no reason to dissemble what they said or their behaviour. Also, the fact that interviews mostly took place on-site where participants lived and/or worked (and

therefore within context) made it difficult for them to skew the stories they confided in me.

2.5.2 Interview management

There is an inherent risk within case study research, and in particular within the setting of this research to just keep going and not stop. As indicated above, this research as such does not have a beginning or an end in the conventional sense due to the fact that I am a local community member and will continue to be so after this research is completed. I have spoken with locals about the changes taking place in the environment for a long time before even considering researching what is happening in depth and I will continue doing so long after this work will be finalised.

Possibly, discussions will even increase in the future and become even more vivid and richer given the projected changes in global climate and the continuation of unsustainable development. It is, therefore, very tempting to continue collecting data. After all, this research is a moving target. Will it ever be possible to get the full story? Should I not just keep going? Before asking such questions it is vital to ask whether further interviews than those initially devised would truly and significantly add to the insights gained. The fact remains that any formal research must have a beginning and an end. At some point the decision has to be made to discontinue further data collection. For this reason, I mapped out a data management plan: I would conduct as many interviews until I noticed a degree of saturation. I made sure to set aside ample time for interview transcripts and notes of interviews and observations as soon as possible after data collection. After I had completed transcribing, I distanced myself from the interviews by doing something entirely different (mostly this involved some sort of outdoor activity) so that I would “not get too close to the data [to be] unable to see their wider significance” (Hartley, 2004, p. 329).

2.5.3 Interview analysis and coding

According to Hartley (2004, pp. 329-330), there is a further risk of reaching premature closure, having been unduly influenced by particularly vivid, unusual or interesting data. Ways of guarding against such a risk include the careful description of the data and the development of categories and key themes. By creating theme-related tables, I was able to assign the interview data accordingly. This also enabled me to identify not only patterns but also insights that might offer alternative approaches, for example in dealing with coastal erosion. Yin (2009, p. 98) points out the need for final explanations to be accurate and complete interpretations doing justice to the participants' "facts and features" and also to give consideration to possible alternative explanations/interpretations.

Furthermore, it is worth pointing out that narratives by themselves are not the most interesting part of the case study. Hartley (2004) notes that narrative alone is not so much of external interest. First and foremost, raw narratives represent an immense amount of data. In order to make this data digestible, it is important to not only "draw out the wider implications of the study while giving a strong sense of the particular circumstances of the case" (ibid., p. 330), but also to code the narratives accordingly. Initially, I coded the narratives according to the key themes introduced at the beginning of this section. These are the same themes that also served as guidance for the interview process: (i) knowledge of the Coromandel Peninsula's coast and ongoing development; (ii) perception of climate change salience; (iii) local knowledge; anticipated environmental changes; (iv) adaptation already underway; and (v) governance roles and responsibilities and future development prospects. Subsequently, I allowed the narratives to guide the development of subsections. This was very important for a more detailed overview of what had been said. Instead of using predetermined themes, these subsections arose from the narratives themselves and reflected exactly what participants spoke about and had to say. A total of 14 subcategories evolved from the 57 interviews:

1. Adaptation underway;
2. Climate change salience;
3. Coastal defence;
4. Wider challenges;
5. Hazards and environmental challenges;
6. Insurance;
7. Local knowledge;
8. Option development;
9. Politics;
10. Power;
11. Problem detection;
12. Roles and responsibilities;
13. Coastal development; and
14. Coastal erosion.

The above 14 subcategories enabled a better understanding of what lies at the heart of those interviewed. Also, the subcategories made easy an assignment to the framework to diagnose adaption barriers by Moser and Ekstrom (2010), which I only discovered after I had completed most of the interviews. Due to the fact that this framework was particularly suitable for the narratives I had garnered, it became a fundamental part of this thesis's structure, which I explain in detail in the following chapter. In essence, the framework is made up of three core components of a rational decision-making process: (1) understanding; (2) planning; and (3) managing. As I will also explain later on, these components break down until they make possible the identification of real world adaptation barriers, which in turn, can be bonded with the 14 subcategories that emerged from the narratives.

Despite the fact that I had analysed and coded the narratives and a fusion with the Moser and Ekstrom (2010) framework presented itself almost naturally, I felt that an innovative visual coding would make the narratives all the more accessible.

Consequently, I generated word clouds (also known as tag clouds) for each of the three communities making up this case study research. These word clouds represent each community's distinct 'flavour' and instantly visualise what lies at each according community's heart. While such a visual representation is no stand-alone research or coding tool, it nonetheless represents a supplementary form to conveying the essential nature of what would otherwise be data requiring a lot of time and effort to work through. Programs for generating word clouds essentially delivering the same results and working in the same way include *Wordle*, *Tagxedo*, *TagCrowd*, *MakeCloud*. Programs such as *Atlas.ti* by Stanford University or *NVivo* are also capable of processing data in a similar way as the programs above and generating word clouds yet they tend to be less versatile and less visually appealing (Ramsden & Bate, 2008). Word cloud programs are described by education researchers Carmel McNaught and Paul Lam (2010, p. 630) as "scholarly toy of [potential] worth to the academic community".

Word clouds represent the frequency of words in a given text. The reader is given an overview of the common themes or phrases used within this text. Insights into general patterns are enabled. The overview results in an "aesthetically pleasing presentation where different font sizes are coordinated to create an attractive visualization compared to blocks of text or lists of words" (Wang, Dent, & North, 2013). However, this "scholarly toy" (McNaught & Lam, 2010, p. 630) has its limitations and is only useful as supplementary tool for coding. Without manipulation, word clouds do not convey a context since "each word is treated as the unit of analysis [and] the semantics of the words and also the phrases and even sentences the words are composed of [are neglected]" (McNaught & Lam, 2010, p. 641). A way of overcoming this limitation is by manually connecting words. Examples include *central + government*, *beachfront + property*, or *climate + change*.

Notes I took during the interview process further assisted in the analysis of the data by adding the unique local 'flavour'. The notes I took included observations of the surroundings and the participant. Qualitative health researchers Peggy Field and Janice Morse (who is also a trained anthropologist, 1985) describe this process as taking memos. Such memos can include anything of possible relevance to the study. In this case, issues of relevance included, for example, the proximity to the high-tide mark or the evidence of hazard exposure, i.e. a house built in the flood path. The taking of memos for the research process contributed towards my familiarisation and awareness of the locals' life-worlds (Burnard, 1991), which also includes cultural backgrounds.

2.6 Individual, collective, and public narratives rooted in history

Yesterday's just a memory, tomorrow is never what it's supposed to be.

—Bob Dylan

Since narrative is the key means through which people produce a reality, it is rooted in personal and social histories and in what is seen as socially significant or social intelligibility norms (Gergen & Gergen, 1986). While historian Carolyn Steedman (1996) contests that the past becomes altered as we try to grasp it, philosopher and historian of the sciences Ian Hacking (1994) points out how our memories work as part of creating a story and the past is interpreted by what we know here and now:

[O]ur memories shade and patch and combine and delete.... [T]he best analogy to remembering is storytelling.... [W]e constitute our souls by making up our lives, that is, by weaving stories about our past, by what we call memories. The tales we tell of ourselves and to ourselves are not

a matter of recording what we have done and how we have felt. They must mesh with the rest of the world and with other people's stories... (Hacking, 1995, pp. 250-251).

Memoires and stories constantly change which is why there is no objectivity and no facts of the matter, neither for the researcher nor for the research subject. For this reason, people construct identities (Lawler, 2002). This is referred to as narrative identity (Ricoeur, 1991b) or ontological narrativity (Somers & Gibson, 1994). Again, the key lies in interpretation. "The past is re-used through the agency of social information, and that interpretation of it can only be made with what people know of a social world and their place within it" (Steedman, 1996, p. 5).

Since we all tell stories, "it is through such stories that we make sense of the world, of our relationship to that world, and of the relationship between ourselves and other selves and how nothing stays the same" (2002, p. 249). Political ecologist Tim Forsyth (2007) writes that it is impossible for there to be a 'true' or 'false' in conventional scientific terms. Anthropologist Arturo Escobar (1996) claims that narrative needs to be understood as tool through which our environment is historically produced and known.

Naturally, the stories presented and insights gained are not the same. Each and every story is different because the world is experienced and perceived in different ways. Narrative reflects individuals' values, interests, and histories with respect to a particular subject (Kilduff & Mehra, 1997; Riessman, 1993; Winslade & Monk, 2000). In other words, there is not one single all-encompassing reality, as much as there is no single all-encompassing history. Theologian Stanley Grenz (1996, p. 109) puts this into perspective:

The old objectivist⁴⁸ position is no longer viable.... [T]here is no single, timeless truth existing out there independent of particular perspective or method waiting to be discovered by means of scientific procedures.

Rather, there are multiple and divergent histories and narratives. However, despite these different stories and realities, a “fusion of horizons” (Koch, 1998, p. 1189) takes place when people inhabit the same part of the world, in this case the Coromandel Peninsula. This fusion, together with the mix of certainty and uncertainty, and the resulting controversy provides an ideal toehold for narrative analysis thus creating a platform enabling a juxtaposition of our shared reality.

Narrative policy analyst Greg Hampton (2009) furthermore points out the particular usefulness of narrative analysis for understanding public participation and consultation as key factors for coastal climate governance throughout the policy development and the planning process. Consequently, narratives of individuals must always incorporate narratives of others and circulate socially in the form of public narratives (Lawler, 2002). Such public narratives, Social theorists Margaret Somers and Gloria Gibson (1994, p. 62) contest, are part of “cultural and institutional formations rather than the single individual”, and include stories as part of policies (such as those the Thames-Coromandel District Council is guided by).

Cultural and institutional formations are ideally exemplified based on local newspaper reports. As it stands, weather impacts and regional development represent key local issues, both on the political agenda as well as in public debate. Interestingly, a connection with climate change is not yet made. However, hardly an edition of one of the local newspapers⁴⁹ on the Coromandel Peninsula goes to print

⁴⁸ Objectivism is a philosophy based on insights by US-Russian philosopher Ayn Rand. Fundamentally, Rand’s philosophy claims that individuals live for their own interest. Rand’s philosophy was used by former Federal Reserve chairman Alan Greenspan to promote capitalism. US writer Gore Vidal described objectivism as “nearly perfect in its immorality” (Rubin, 2007, para. 3).

⁴⁹ The *Peninsula Press* and the *Hauraki Herald* are the main local newspapers on the Coromandel Peninsula.

without a story about local weather events. Articles reporting on regional development (i.e. subdivisions) are frequent, thus demonstrating the ubiquity in public narratives. Figure 2.5 provides an overview of local newspaper headlines dealing with these issues over the past years. The headlines were selected based on their relevance for this research and show that, despite ignoring climate change, matters are challenging as it stands.



Figure 2.5: Selected local newspaper headlines collected over the research period showing the ubiquity of the local key issues of direct relevance to this research.

2.7 Place-based research

Place as such and the surrounding environment influence understandings of and insights into local issues. As I have discussed above, this is what gives this research much of its value and significance. Having spent seven years in a comparatively small coastal community setting has provided me with insights and understandings I would not have acquired otherwise. Ethnographic research of this kind results in a bridging of the chasm between context and composition and the mutually

reinforcing and reciprocal relationship between people and place (Cummins, Curtis, Diez-Roux, & Macintyre, 2007).

Being a local community member meant that locals knew that their stories about local issues and contestations were told within context. My personal familiarity with the area, for example, enabled locals to refer to local landmarks within the stories they told. I also noticed that in small, close-knit community structures such as on the Coromandel Peninsula, locals choose carefully who they open up to and tell their story to. Usually, introductions followed similar patterns if people had not already heard about this research or already knew me: “Where do you live? ... aah, I know that place, that area has some good fishing”. Sometimes, a local also identified someone else or a particular landmark in the vicinity to test if I knew that person or place too. Usually from there on a few more local ‘security’ questions such as “What do you do there?” or “How long have you lived there?” were asked which led to the exchange of some local anecdotes and stories. Such cordialities helped build trust and understanding and enabled those interviewed to gauge my intentions.

My experience also showed that place-based *snowball sampling* held strong potential for this study. The snowball effect works in a way that a key participant is taken by the research, the interview, or the stories exchanged and points out someone else who may be in a position to contribute in a meaningful way. Consequently, doors I did not even know existed, opened. I also found that my knowledge of the local backcountry left a positive impression on many locals. In the views of many, those wilderness⁵⁰ areas are regarded as areas only ‘tough blokes’

⁵⁰ In line with the International Union for Conservation of Nature (IUCN, 2013), I personally understand the term wilderness as “a large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition” (para. 1). Arguably, the Coromandel Forest Park fits this description. The park’s accessibility off the track is challenging and can be dangerous due to its ruggedness and steepness.

go to, which, when the topic arose, helped to overcome some participants' reservations⁵¹.

Being a member of the local community with the associated social networks has provided me with insights into community interactions and relationships, as well as interactions between humans and their environment. As long as I will be living on the Coromandel Peninsula, I will be interacting with people affected by the impacts of a changing climate. Ethnographers Martyn Hammersley and Paul Atkinson (1983) confirm that it is impossible to study the social world without being part of it. Place-based research, Hammersley and Atkinson (1994, p. 249) argue, consequently becomes less a method and more a characteristic "mode of being". Being based where the research takes place can be indispensable in comprehending community networks and local adaptation efforts.

Furthermore, understanding the prospects of how climate change affects adaptation requires understanding of the sensitivity of the impacted region (IPCC, 1996). It can, therefore, be asserted that knowledge, insights, and understanding are mostly time and place specific. Through interaction with the community on a daily basis, effective communication, application, and follow-through of relevant science are immensely facilitated (USGS, 2010). This is where a place-based approach is invaluable. The U.S. Geological Survey (2010) states that place-based researchers become information brokers of the deep-rooted institutional knowledge that comes from being in a place long enough to learn its lessons and grow familiar with its cultural rhythms and history.

Similar observations can be made with regard to the involvement of absentee owners. In the case of this research, these were Auckland residents who owned property on the Peninsula. These participants required a fundamentally different basic requirement for meaningful engagement. I found the same to be true for the majority of officials and politicians I interviewed. In principle, I have found that

⁵¹ Cf. the "greenie" discussion under Section 2.1.

commonalities connect and so, if I did not have an urban background while being a member of the local yet rural community at the same time, I doubt that the interviews with these stakeholders would have yielded the depth and pregnancy required for rich and valuable insights.

Also, when it comes to engaging with and interviewing local and regional government staff members, I found that my background in the Department of Conservation opened many doors which I would probably not have been aware of otherwise.

2.8 Tangata whenua

In order to gain an appreciation of the complexity of the context-specific social-ecological relationships, it makes sense to invite tangata whenua, or ‘the people of the land’ to the table. There is a multiplicity of sound reasons for doing so; First and foremost the reasons for including local Māori residents are ethical, moral, and instrumental. In line with Hardy and Patterson (2012), I argue that addressing environmental issues in New Zealand and further afield requires both Western and indigenous knowledge. The simple reason that tangata whenua are New Zealand’s indigenous population with a settlement history dating back to between the 13th and 14th century (Europeans arrived in the late 1700s) puts local Māori in a unique position to make contributions to ethnographic research of this kind.

While I am not in a position to conduct research according to Kaupapa Māori principles where Māori are specifically involved (by Māori researchers) in order for the research to benefit Māori (S. Walker, Eketone, & Gibbs, 2006), I argue that this work would be incomplete by nature if local Māori were left out. Moreover, given the aim of this research to overcome ‘business as usual’ in climate change adaptation, I deliberately move beyond business as usual and the generally persistent hegemony of Westernised positivistic research (or knowledge imperialism) failing to include Māori perspectives (Cram, 2001). Traditionally, Smith

(1999, pp. 1-2) writes, “western discourse about the other” involves collecting, classifying, and representing indigenous insights “back to the West, and then, through the eyes of the West, back to those who have been colonised”. Indeed, including indigenous insights into the wider climate change scholarship continues to be an exception. Indigenous peoples in general are largely overlooked by the IPCC and in the climate change discussion in general. When it comes to climate change, indigenous peoples are regarded as “passive and helpless at best, and as obstructionist and destructive at worst ... with roots going back to colonial periods and reoccurring in contemporary discussion of development, conservation, indigenous rights, and indigenous knowledge” (Salick & Byg, 2007, p. 4). Norgaard (2001, cited in Hardy & Patterson, 2012, p. 75) confirms that “the voice of indigenous people are in a distant corner”, and verifies that the implementation of solutions “requires contextual, experimental and in some cases, traditional or indigenous knowledge of local people and practitioners”.

As I will explain in Chapter Seven, the main contribution from a Māori perspective for this research comes from Harataunga/Kennedy Bay. The initial contact was made through the kaumatua’s daughter who works for the local council and introduced me to her father Winiata Harrison. Māori environmental scientist Garth Harmsworth (2005, p. 38) confirms that the effectiveness of working with tangata whenua often depends on “finding the right people or representatives with the right skills, expertise, understanding, knowledge, and temperament”. When I visited Winiata and his wife to explain this research and my intentions, I found two points decisive for the door to the community being opened: First, the fact that it was my genuine intention to include Māori perspectives into climate change adaptation research; and second, that the aim of my work is for the long-term benefit of everyone on the Peninsula which includes local iwi and Māori people in general. The significance of the latter is underscored by Kaupapa Māori researcher Fiona Cram (1993) who confirms the importance of research involving Māori to serve the community and not merely build the researcher’s status. Indeed, as I learned in the course of the interviews, some Harataunga/Kennedy Bay locals, such as the

following participant (2012, pers. comm.), had participated in other research projects or interviews in the past, but were never contacted again after the researcher had obtained what he or she came for:

I have participated in research like this before, with another PhD student from Napier who wanted to know about the fishing and the fisheries and I ended up absolutely hating the Ministry of Fisheries because they stole all our information and they used it against us.... These things frustrate me.... We are now being denied what we've been brought up on. Now we are being told what we can do and what we can't do.... I don't trust any of the Government Departments [anymore].

Overall, my impression was that locals were concerned that I would take advantage of them and then disappear with their information that could potentially be used against them, only to never be seen again. Experiences such as those described by the above participant had left a bad aftertaste and it required first and foremost honesty and at times persuasiveness to explain that this research was different on a variety of levels, including its approach and methodology. It is further different because the Coromandel is where I live too and it is different because this research is not about resource extraction but about identifying ways for local communities to be better prepared for the future.

In addition to the reasons for including Māori insights already mentioned, the continuity and high degree of commitment to the area where Māori people live, as mentioned by geographer Martin Manning, et al. (2011) further contribute to the significance of involving local Māori community members. Also, the aforementioned traditional environmental knowledge (TEK), which is handed down over generations, plays a significant role. Such knowledge which can be found among people of communities that, on a daily basis and over long periods of time interact for their benefit and livelihood with ecosystems can provide an

understanding of how to cope with dynamic change in complex systems (Berkes, Colding, & Folke, 2000, 2003; Fabricius & Koch, 2004).

According to Māori worldview, everything on Earth is related through whakapapa⁵². This understanding forms the basis for the “organisation of knowledge in the respect of the creation and development of all things” (Barlow, 1994, p. 173). While this often, if not mostly, clashes with a western worldview, it is through whakapapa that traditional Māori are attuned to their environment since everything natural including rocks and mountains are believed to possess whakapapa. Arguably, this further places Māori in a special position to detect change and have their spiritual connection affected by it.

In the community of Harataunga/Kennedy Bay (Chapter 6) there is strong emphasis on maintaining a traditional way of life with a close connection to the environment. Tradition is strongly visible in this community through the way the community is set up with the wharenuī (sacred meeting house) at the centre which has a bearing on the sense of community. This is further reflected in the local *Kura Kaupapa Māori* School teaching exclusively in Māori language but also in the somewhat unusual absence of beachfront property development (as I will explain in detail in Chapter 6).

Even though it did not become necessary at any stage during my research, I had established contact with a cultural advisor at University and the local Iwi Manager prior to conducting interviews (which I also highlighted in my human ethics application [MUHEC]). This contact was important to have in case not only I would have found myself in a cultural situation I was uncomfortable in but also in case a participant was uncomfortable with the interview process.

⁵² Whakapapa is defined as the “genealogical descent of all living things from the gods to the present time” (Barlow, 1994, p. 173).

2.9 Constraints and limitations

As much as an awareness of the advantages of chosen methodology is crucial, it is equally important to be aware of possible constraints and limitations. A key difficulty I found was to make the decision about which information and insights to include and which to exclude. While the focus of the research provided a basic framework for the relevance of stories told, the unique local context made it challenging to make these decisions. I found that, only through an understanding of local context, was I able to reduce this challenge.

In an ideal world, sociologists and grounded theory⁵³ founders Barney Glaser and Anselm Strauss (1999) assert, all data should be accounted for. Unfortunately, this is not practical due to the fact that there are parts of interviews that are simply not relevant to the research question or simply not useable. Nonetheless, unused data provides a backdrop to determine what is not included in the final write-up. Qualitative health researcher Philip Burnard (1991) highlights that uncodable pieces of transcript interestingly only appear unusable at the analysis stage, whereas during the interview what was said appeared to make perfect sense.

A further difficulty when dealing with personal insights and experiences is to determine the extent to which one person's narrative is comparable with that of another person. This is particularly challenging when dealing with an inherently complicated, complex, and locally contested issue such as climate change. The reason for this is the mix of certainty and uncertainty, and the resulting controversy. Documenting insights and understandings seems, on the surface, relatively straightforward with the methods established in the social sciences. After

⁵³ The grounded theory is a research method by which data is collected and a reverse engineered hypothesis is made. This method is contradictory to the traditional social science approach where a theoretical model is selected prior to data collection (cf. Martin & Turner, 1986). Strauss and Corbin claimed 20 years ago (1994) that anthropologists are increasingly using grounded theory which indeed has since become a general qualitative method acknowledging "multiple perspectives and multiple forms of knowledge" (Charmaz, 2011, p. 374). However, not all anthropological research applies this methodology.

all, ethnography and case study research represent an entire 'tool box' of a wide range of different tools that can be used to conduct research. However, analysing and presenting the findings is a different story. The challenge here lies in the interpretation and presentation of the data collected.

Before attending to the stories people have told, I continue on the path set out in this thesis. The scholarly journey takes the reader from the preceding methodology in Chapter Two to a theoretical adaptation framework based on political ecology and environmental planning in the subsequent Chapter Three. I begin by explaining how and why political ecology and planning complement each other, how they are distinct from each other and in what way they make a contribution towards understanding local stories.

As is the case with the "best journeys", surfer and writer Jeff Johnson points out, "questions that in the beginning you didn't even think to ask are answered" (Malloy, 2010, Introduction section, 6 min. 34 sec.). It all began with an interest in what climate change will entail for the place I have made my home. The initial idea has since developed into the aim of comprehending why adaptation has yet to evolve, 'business as usual' prevails, and climate change understanding remains largely absent. However, in order to pursue this aim, it is essential to make sense of the relevance of human-environment relationships and identify the shortcomings of climate change adaptation work. Given the scholarly context in which this work is located, the following chapter further establishes an understanding of the role adaptation plays in political ecology and planning.

3

Political ecology, planning, and how to address barriers to climate change adaptation

We think not only as individuals and as human beings but also as members of particular communities with certain distinctive cognitive traditions that affect the way we process the world in our minds.

—Eviatar Zerubavel, *Social Mindscapes*

There is a lack of emphasis by planners and decision-makers on adaptation in New Zealand (J. D. Ford, Berrang-Ford, & Paterson, 2011; N. E. White & Buultjens, 2013), and “adaptation strategies tend to be very low priority for the general public” (Blackett, Smith, et al., 2010, p. 1). To date, the rubber of the adaptation imperative does not meet the road of reality and adaptation remains on the back seat of priorities resulting in what Burton (2009, pp. 91-92) describes as “persistent adaptation deficit”.

This case study of climate change on the Coromandel Peninsula incorporates a framework to diagnose barriers to climate change adaptation developed by Moser and Ekstrom (2010) as part of the conceptual framing. Complementing this framing is an analysis of political ecology, planning, and adaptation literature. In this Chapter, I address this thesis’s first objective by answering the question what the

relevance of human-environment relationships is when it comes to adaptation and also what the shortcomings of not only existing climate change adaptation work is and I investigate the role of adaptation in political ecology theory and the planning discipline. While the framework to diagnose barriers to climate change adaptation (Moser & Ekstrom, 2010) targets the process of planned adaptation, it is not specifically linked to political ecology or planning.

The coupling of political ecology and planning (Figure 3.1), in the context of climate change adaptation and the associated barriers, provides a novel and meaningful perspective. This is even more so the case with regard to the methodology chosen. As such, I take a practical real world approach and shed light on why adaptation remains on the backburner of attention. The conceptual framework of planning and political ecology, together with the framework by Moser and Ekstrom (2010) provide the architecture for the case study of the Coromandel Peninsula. This architecture is built on the overarching issue of coastal erosion which not only requires sound planning but is about politics and the issues covered by political ecology. In other words, the process of adaptation in general, and dealing with coastal erosion in particular, is fundamentally political and wicked (Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007; D. Ludwig, 2001, p. 759; Rittel & Webber, 1973). This chapter demonstrates that the key in this multidisciplinary and overarching approach lies in the realisation that the sum is greater than the parts.

Some recent work has been published on adaptation barriers, including institutional barriers, which I introduce in this chapter. However, the framework by Moser and Ekstrom (2010) presents a practical and helpful way to make sense of barriers and the fact that there is a compelling reason to address these. By bringing political ecology and planning to this framework, I demonstrate that there remains a long way to go before a lack of understanding or misunderstanding is overcome and adaptation strategies are embedded in both institutions and minds (Adger, Dessai, et al., 2009; Biesbroek, Termeer, Kabat, & Klostermann, 2009).

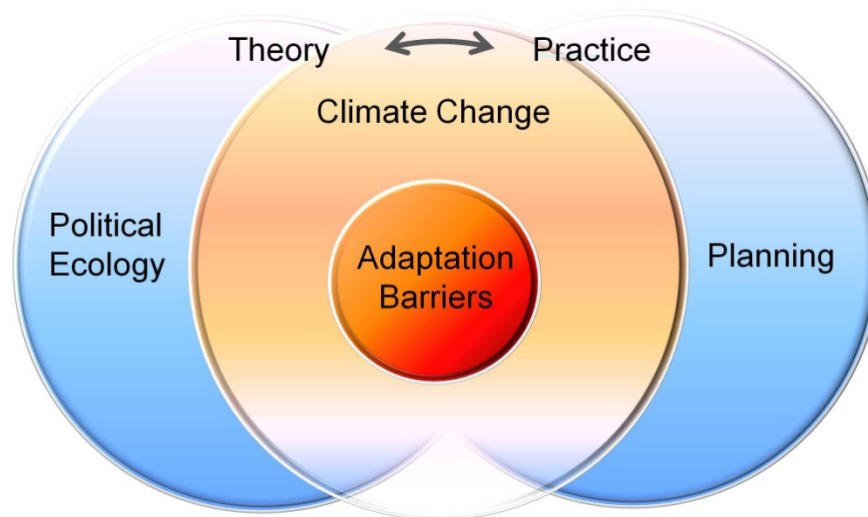


Figure 3.1: The role of political ecology and planning in framing barriers to climate change adaptation.

Political ecologist Raymond Bryant (1992, p. 13) describes political ecology as an *inquiry* into the “political forces, conditions and ramifications of environmental change”. Together with Sinéad Bailey, Bryant (1997, p. 190) frames political ecology as a *debate* focusing on interactions between the state, non-state actors, and the physical environment (cf. Forsyth, 2003, p. 4).

Blaikie and Brookfield (1987, p. 17) write that “[p]olitical ecology combines the concerns of ecology and broadly defined political economy”. Put simply, political ecology is the political economy of the environment. Political ecology concerns itself with social and political conditions with regard to environmental dilemmas (e.g. Blaikie & Brookfield, 1987; Bryant, 2001; Greenberg & Park, 1994; Zimmerer & Bassett, 2003). An organising question covering political ecology’s key aspects is “how are social relations, including power structures, intertwined with ecological processes at varying scales?” Political ecology addresses the role of human agency, institutions, and social choices in shaping environmental change, ecosystem health and human development prospects (cf. Blaikie & Brookfield, 1987; Bryant & Bailey, 1997; Peet & Watts, 1996). Political ecology is distinguished from other bodies of scholarship through a politicisation of environmental change and degradation. As such, it is distinguished by its framing of human-ecological interactions as

fundamentally political. The task set by political ecology, as defined by environmental law and policy researcher Michael M'Gonigle (1999, p. 14), "is to situate human actions within the processes of the natural world, and to legitimise them to the degree that they can co-exist in balance with that world".

Interestingly, the political ecology task outlined by M'Gonigle (1999) is precisely what climate change adaptation seeks to accomplish. Despite considerable variation of the meanings of adaptation (depending on the theory or practice) (cf. Ekstrom, Moser, & Torn, 2011), the basic principal underlying adaptation is to make social-ecological changes with regard to climate change, regardless of whether climate change is already taking place or it is anticipated. A logical question, therefore, is to ask in what way and to what extent the interpretive analysis framework set out by political ecology makes practical contributions enabling climate change adaptation to advance?

Critics argue that political ecology is insufficient for addressing adaptation practice. The reason for this is that it is conceptual for the main part, and not practical. Social philosopher André Gorz (1993, 2010), for example, draws attention to political ecology's practical struggle in identifying modalities in defining ways to close the gap between ecosystem demands and autonomous individuals' own judgements. Political ecologist Peter Walker (2006) confirms this struggle with practical application. An interesting anecdote Walker reports of, is a comment made by an eminent political ecologist at the 2000 Annual Conference of the Association of American Geographers. The political ecologist felt "no obligation to be *useful*" (2006, p. 382, emphasis in original).

Sociologist of science and social theorist Bruno Latour (1998, p. 224), on the other hand, writes that "[i]n practice, (therefore), ecological politics is much less integrable than it fears, but a lot more marginal than it would like to be". However, Latour fails to provide examples of political ecology's practical application. Latour criticises political ecology for its self appraisal and "utopian ideals" (ibid., p. 233)

and yet highlights that political ecology's practice is most valuable, yet again he provides no detail of the practical contributions. Given political ecology's wide scope implying a limit in practice, Warren, Batterbury, and Osbahr (2001, p. 79) argue that what is needed is a stronger focus on local decision-making and recognition of context. Using soil erosion in the Sahel as case study example, Warren, et al. (ibid., p. 79) demonstrate that a way to advance political ecology so that it becomes more practice-oriented is through a "local political ecology". In a review of the concept of adaptation with a focus on scholarship contributing to a practical implementation, Smit and Wandel (2006, p. 284) write that adaptation is "implicit" within political ecology.

Arguably, political ecology and the planning discipline complement one another. Planning represents a professional practice and body of scholarship through which political ecological aspirations can be realised. The political ecology framework is "spatial in character" with both a "social and a physical dimension" (M'Gonigle, 1999, p. 14). Planning practically embraces the limits implicit within political ecology. Planning examines 'space' which is "the result of social relations among people living in a certain area or region (territory as social constructed space) where culture and cultural influences play a crucial role" (Knieling & Othengrafen, 2009, p. xxiv). Planning can be summarised as "place-based problem-solving aimed at sustainable development" (Davoudi, Crawford, & Mehmood, 2010, p. 14). What is more, as John Friedman (1987) highlights, planning links knowledge to action. However, Friedman himself writes the following 21 years later that "the jury on what sort of planning we should have and how much 'knowledge' (and even what sort of knowledge) is necessary for good planning, is, I'm afraid, still out" (2008, p. 251, inverted commas in original). In other words, there is a sound argument to complement planning by selectively adding knowledge. In this sense, drawing on a political ecology perspective is useful for planning for climate change adaptation as it provides fundamental insights into the "conjunction of culture, society and nature" (Oliver-Smith, 2004, p. 11).

Planning manifests inherent shortcomings in addressing wickedness. This becomes evident in a recent quantitative comparison of 275 articles published in leading theoretical and practice-oriented academic planning journals between 2010 and 2011 (Roggema & van den Dobbelsteen, 2012). The authors found that “the vast majority (95%) of the academic publications address planning as stationary responding to tame, linear problems” (p. 608). Ergo, planning is simply not addressing wicked problems such as climate change adaptation in the way it is designed, or even meant, to do. This gap prompted sustainability planner Stephen Wheeler to call for a “re-conceptualis[ing of] the field of planning so that it can take its proper place leading this effort [of addressing climate change adaptation]” (Wheeler, 2010, p. 25). Such a re-conceptualisation, Wheeler argues, implies that the realities of “unsustainable levels of population, consumption, and inequity” are addressed and that the underlying issues behind why societies struggle to come to terms with sustainability challenges such as “dysfunctional democracy, poorly regulated capitalism, and unhealthy social ecologies” need to be resolved (p. 18). In other words, the political ecology of the spaces within which planners operate must be investigated. As it stands, planning is not adequately addressing the drivers of climate change, wider unsustainable practices and struggles to come to terms with non-linear problems within complex systems resisting resolution (Rittel & Webber, 1973). By its own nature, this is not a surprise in a global context where action and practices “perpetuate actually existing unsustainability” (Barry, 2012, p. 10).

Nonetheless, planners can be part of a transformative movement to require the status quo to curb unsustainable practices, which by default, includes adapting to climate change. The question therefore becomes what planners can do practically do to bring about transformative change. Overcoming institutional barriers to sustainability in general and climate change adaptation in particular represents a promising approach. This approach is taken here by connecting planning and political ecology with a framework to diagnose barriers to climate change adaptation. Political ecology is a “body of analysis which is oriented to discerning the necessary underpinnings for systemic institutional change, that is, for a new

sustainable configuration of institutions, infrastructures, and power relations into which society might grow” (M'Gonigle, 1999, p. 15). In other words, political ecology puts the politics of the environment in the centre. The challenge for planning lies in translating this understanding into practical action. As this thesis elucidates, this is not a simple black or white issue or choice. On the contrary, the choice must be a combination of a range of factors and decisions influenced by politics. In the following two sections, I discuss the according factors at play and political ecology’s and planning’s contribution with regard to climate change adaptation.

3.1 Adaptation and political ecology

I am withdrawing because I have come to view the part of the IPCC to which my expertise is relevant as having become politicized.

—Christopher Landsea, *IPCC resignation letter, January 17, 2005*

The familiar United Nations Agenda 21 slogan “Think Globally but Act Locally” hits right at the heart of the climate change dilemma. The slogan paraphrases not only the multi-level social-ecological connections and scale innate in climate change, but also makes clear the need for local action. Ethnographic work and planning practice too both focus on the local level. Ostrom (ibid.) confirms the potential small- to medium-scale governance units hold in addressing the complexity of climate change. While climate change is a global predicament and collective action problem, adaptation is inevitably local (Agrawal, 2008).

In broad terms, adaptation aims at reducing vulnerability and increasing resilience (Adger et al., 2007). Vulnerability, from a climate change perspective, refers to

people's ability to cope with and respond to stimuli, essentially a function of exposure, sensitivity and adaptability (McCarthy, Canziani, Leary, Dokken, & White, 2001; Smit & Wandel, 2006). According to the Intergovernmental Panel on Climate Change (IPCC, 2007a, chapter 17.1) the vulnerability of a society is "influenced by its development path, physical exposures, the distribution of resources, prior stresses and social and government institutions (R. N. Jones, 2001; Kelly & Adger, 2000; O'Brien et al., 2004; Smit & Wandel, 2006; Turner et al., 2003; Yohe & Tol, 2002).

Within political ecology, vulnerability further refers to livelihoods, power relations and resource access that leads to fragility, marginalisation and exclusion (Adger, Benjaminsen, Brown, & Svarstad, 2001; Blaikie, Cannon, Davis, & Wisner, 1994; Oliver-Smith, 2004; Pelling, 1999). It would be the most straightforward option to adopt the adaptation definition set out by the Intergovernmental Panel on Climate Change (IPCC). Thus, adaptation comprises "adjustment[s] in natural *and* human systems in response to actual and expected climate stimuli or their effects, which moderates harm or exploits beneficial opportunities" (IPCC, 2001a, p. 982, emphasis added). However, the IPCC definition has its limitations. This definition has since been criticised most strongly by environmental scientist and meteorologist Roger Pielke, et al. (2007). In *Lifting the Taboo on Adaptation*, Pielke, et al. (2007) argue for a perspective beyond the IPCC's "climate stimuli and their effects" (p. 982) and define adaptation in terms of sustainable development. This criticism is supported by environmental economist and geographer Neil Adger, et al. (2007) and further refined by environmental governance researcher Emma Tompkins, et al. (2009) who argue that climate stimuli are not the sole reason for adaptation action. Complex social drivers to be found in political and economic contexts play a decisive role. Social drivers and their interdependencies (Smit & Wandel, 2006) are deeply rooted in institutional capacity and its legislative context but also in research and societal change in a general level.

Moser and Ekstrom (2010) incorporate the above criticism in their definition of adaptation and advance the IPCC's definition in two significant ways decisive for

this work. The authors (ibid.) not only criticise the IPCC's assumption of the effectiveness of adaptation but also the dichotomy with regards to natural and human systems. The separation of these inherently connected systems was already criticised over 35 years ago by, among others, political ecologist Alan Miller (1978, pp. 56, 101):

A primary contribution of a "political ecology" movement should be to demythologise this idealist mystification of the human/nature relationship and to begin the construction of a new, holistic ethic.... With nature and people increasingly viewed as having only commodity and exchange value, the acquiescence of science to that same perspective can only lead to a deepening dehumanization within society and to a further exploitation of nature.

The above explanation by Miller (ibid.) summarises one of the two core reasons for basing this work in political ecology, the other being the axiomatic omnipresence of power and politics with regard to resource management issues. Berkes, Colding and Folke (2001) confirm the delineation between social systems and ecological systems as arbitrary and artificial (see also Costanza, Low, Ostrom, & Wilson, 2001; CSIRO, 2013; Folke, Pritchard, Berkes, Colding, & Svedin, 2007). Consequently, the adaptation definition underlying this work, adopted from Moser and Ekstrom (2010, p. 22026) is as follows:

Adaptation involves changes in social-ecological systems in response to actual and expected impacts of climate change in the context of interacting non-climatic changes. Adaptation strategies and actions can range from short-term coping to longer-term, deeper transformations, aim to meet more than climate change goals alone, and may or may not succeed in moderating harm or exploiting beneficial opportunities.

In principle, adaptation to climate change can take place for a variety of reasons or be the result of a variety of triggers. Reilly and Schimmelpfennig (2000), for

example, point out that “systems can develop the institutional capability to adapt and respond autonomously” which can take place in the absence or presence of climate stimuli. Adger, Arnell, and Tompkins (2005b, p. 79), however, point out that this “unintentional adaptation has the capacity to reduce the effectiveness of purposeful adaptation...”. Put simply, if adaptation is merely the (albeit advantageous) side effect of an action initially unrelated to adaptation, an understanding of the imperative to adapt is likely to remain absent. Consequently, adaptation must represent a conscious and deliberate step. Without this step, there is a real risk for the gap between policy, rhetoric, and adaptation practice to keep widening.

In line with Kabat, et al. (2005), I acknowledge that adaptation cannot achieve an entire elimination of climate risks. Maladaptation, however, results in increased vulnerability (Barnett & O'Neill, 2010; Burton, 1997). Maladaptation can be hidden in ostensible short-term adaptive success or may become apparent in what is believed to be maladaptive at the start yet turn out to be successful. An engineering solution such as, for example, coastal armouring which interferes with local hazard culture and feigns an overcoming of coastal risks in that particular area and enabling development can be maladaptive in the long term as risk escalates in the face of climate change. Ergo, maladaptation reduces the incentive to adapt and limits the choices available to future generations (Barnett & O'Neill, 2010, p. 212). However, “[m]aladaptation is likely given the time lag between changes in climate and changes in institutions” (Barnett & O'Neill, 2010, p. 212).

Despite adaptation itself not being new, “the idea of incorporating future climate risk into policy-making is” (Lim, Spanger-Siegfried, Burton, Malone, & Huq, 2004, p. vii). Lim, et al. (2004) provide a roadmap for adaptation policy-making with the purpose of supporting adaptation processes. For this to happen, the authors argue, cross-sectoral cooperation, an interdisciplinary approach and considerable political will are indispensable. Approaches, such as by means of scientific knowledge, and how these are interpreted, defined by culture and, again, politics come into play

here and matters are far from clear-cut. This insight is underlined in work by environmental scientist Timothy O’Riordan and environmental politics researcher Andrew Jordan (1999) who interrogate cultural theory⁵⁴ to shed light on the inherent contradictions at play when addressing climate change. Such contradictions include the paradox that people are unlikely to proactively adapt or attempt to avert climate change until impacts are no longer ignorable or action is too late. This initial situation is also referred to as the Giddens’s paradox (Giddens, 2009), which is synonymous to ‘ambulance at the bottom of the cliff’: a colloquial term in New Zealand.

Further prominent contradictions include the fact that, on a global scale, those least responsible are worst affected (Barnett, 2006; Gardiner & Hartzell-Nichols, 2012), and that climate change is seen as “less important than nearly all other national or environmental issues” (Leiserowitz, 2006a, p. 46; Lorenzoni & Pidgeon, 2006; Myers, Maibach, Roser-Renouf, Akerlof, & Leiserowitz, 2012). In addition, O’Riordan and Jordan (1999, p. 81, emphasis in original) find that there is “a fundamental institutional ‘failure’” resulting from contradictory interpretations of human behaviour. Human behaviour is, inter alia, shaped by interpretations, perceptions, value systems, ethics, culture, and politics. Human behaviour makes political ecology relevant and places political ecology in an ideal position to frame adaptation and develop an understanding of what is required to develop practical adaptation approaches.

A shift has occurred in political ecology’s focus on human agency, resources, and environmental struggles and how they affect people and places in the developing world. Nonetheless, while developing world studies continue to “constitute the great majority of studies in the field” (P. A. Walker, 2003), increasingly the environment and the pressures placed by human activities (i.e. greenhouse gas

⁵⁴ Cultural theory aims at understanding and analysing the concept of culture as an object of scientific analysis, particularly in the context of culture as adaptive mechanism. According to Smith and Riley (2009, p. 16), cultural theory can be thought of as literature “explaining the nature of culture and its implications for social life”.

emissions) are moving to political ecology's core. In other words, climate change, at least in theory, has become fundamental to political ecology.

However, despite the above shift having occurred within political ecology over a decade ago, research examining adaptation remains few and far between. Political ecologists Richard Peet, Paul Robbins and Michael Watts (2011, p. 10) sum up the situation, writing that political ecology publications examining climate change, let alone adaptation, are "strikingly absent" with little promise of change. In *Political Ecology: An Integrative Approach to Geography and Environment* (2003), political ecologist and environmental scientist Karl Zimmerer and geographer Thomas Bassett omit climate change from their chapter *Future Directions in Political Ecology*, despite climate change fundamentally epitomising the exact issue political ecology is equipped to deal with. Since Peet, Robbins and Watt's (2011, p. 10) recent claim of "striking absence" of climate change publications belonging to the political ecology body of scholarship, little has changed.

All approaches within political ecology have in common an integration of ecological social sciences with political economy (Peet & Watts, 1996; Robbins, 2010). Consequently, there are various points of entry to studying the relationships between political, social and economic factors against the background of environmental issue. The point of entry chosen here is adaptation, which, as described above, is predominantly local. In *Advancing a Political Ecology of Global Environmental Discourses*, Neil Adger, et al. (2001, p. 682) highlights the problem that major discourses associated with global environmental issues are "illegible" at the local scale. In other words, the science associated with climate change appears to ignore the human component including the social mechanisms and processes by which adaptation may or may not occur. International action and scientific assessment at the global or continental scale is suggested as the solution and climate change discourses "do not inform, nor are they informed by, the social processes of adaptation" (Adger et al., 2001, p. 700). Social mechanisms and processes need to address current local problems associated with climate change

and adapt, otherwise future vulnerability, or propensity to suffer some degree of loss or harm (Etkin, Haque, Bellisario, & Burton, 2004), will only increase (which in turn increases the magnitude of future problems).

In summary, political ecology is an analytical approach with, what adaptation researcher Lisa Schipper (2007, p. 4) defines as having “conceptual roots” in adaptation. Notwithstanding, as mentioned, adaptation is both seldom referred to in the political ecology climate change discourse but also struggles to translate theory into practice. Schipper argues that work so far has focused on how to respond to climate change rather than the causes for vulnerability, which puts “the cart before the horse” (ibid., p. 2). Without addressing the actual causes of vulnerability, Schipper (ibid.) points out, adaptation efforts will remain debilitated. Inter alia, this is evident in the limited political ecology research on this topic. Birkenholtz (2012, p. 295) concludes by reiterating Adger, et al.’s (2001) insight that an understanding of adaptation (and vulnerability) will not take place as long as there remains a failure to take into account social mechanisms and processes. Indeed, the “local social heterogeneity, including social power relations”, Birkenholtz (p. 296) confirms, are fundamental to addressing climate change.

Given the complexity of incorporating the local soft infrastructure⁵⁵, thus frustrating the portability of empirical claims and the veracity of policy recommendations (Eakin & Wehbe, 2009; Eakin, Winkels, & Sendzimir, 2009; O'Brien et al., 2004), it does not come as a surprise that political ecology struggles to overcome its practical limitations. This results in the underrepresentation of political ecology in adaptation research. Undoubtedly, a major contributing factor is an axiomatic assignment of a subsidiary role of the social science angle in climate change work (Birkenholtz, 2012; Yearley, 2009).

⁵⁵ Soft infrastructure refers to basic institutions responsible for the cultural and social, as well as the economic and health standards. In the context of market economy, Niskanen (1991) lists the legal system, the accounting system and cultural attitudes under soft infrastructure. From an urban planning perspective and relevant to the way the term is used in the context of this work, urban planner Tim Campbell (2009, p. 196) defines “local knowledge, learning and creativity” as accepted parts of a soft infrastructure and includes “collaborative character and cooperative spirit of a place” (Pinch, Henry, Jenkins, & Tallman, 2003, p. 200).

In addition, political ecology's roots in neo-Marxism further restrict practical adaptation approaches and lead to resistance in its practical applicability from within. Walker (2006) describes how political ecologist Piers Blaikie, as "one of the principal voices in political ecology since its inception" (Muldavin, 2009, p. 1) was accused by neo-Marxist scholars of "selling out the revolution". This happened as a result of Blaikie practically applying his knowledge as consultant and activist. Such an accusation confirms political ecology's practical limitations: "[T]here is the academy and [there is] the messy, constrained world outside" (P. A. Walker, 2006, p. 388). Walker (ibid.) furthermore sees inward-looking tendencies and a focus of debates remaining within the academy as a reason for why political ecology is marginalised and limited in its practical application. Adaptation, after all, refers to actual practical adjustments to climate stimuli as well as "changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change" (Smit & Pilifosova, 2003, p. 879).

Despite political ecology's ostensible suitability for framing adaptation, a gap between rhetoric and reality remains persistent. In essence, political ecology is conceptual and abstract with an underutilised practical application. "Virtually all political ecology research has policy relevance, but policy relevance alone does not mean research is used effectively, or appropriately" (P. A. Walker, 2006, p. 392). In other words, what is needed is practical relevance and application since a practical approach is indispensable when addressing adaptation.

The above insights into potential contributions from political ecology have, above all, confirmed the decisiveness of paying close attention to understanding and practice and incorporating the social factor. First and foremost, this factor is determined by human behaviour. As mentioned, human behaviour is predominantly shaped by interpretations, perceptions, value systems, ethics, and politics. Furthermore, human behaviour takes place within the context of the physical environment, or nature. Here, I will use the term 'soft infrastructure' as core concept referring to this human factor. Despite the term soft infrastructure

being used in a different context, the term reflects the contrast between political ecology and traditional planning approaches. Traditional planning, as I will explain in the following section, has long been preoccupied with hard infrastructure, which essentially refers to the physical, formal networks essential within a modern societal context. I argue that only by paying close attention to the soft infrastructure (as connected through political ecology), adaptation barriers can be addressed and overcome. In order to understand and practically implement adaptation incorporating the soft infrastructure, I will now examine whether turning towards the planning discipline holds the potential for finding an explanation for why the adaptation reality remains embryonic.

3.2 From policy to planning

A policy is a temporary creed liable to be changed, but while it holds good it has got to be pursued with apostolic zeal.

—Mahatma Gandhi

In the previous section, I explained why political ecology offers an important and valuable contribution to climate change due to its dealings with what I have termed soft infrastructure. I have highlighted that political ecology is limited in its practical application. For this reason, I now briefly introduce the adaptation policy framework before drawing on the planning discipline and its potential for climate change adaptation.

In order to practically address climate change adaptation, local authorities in New Zealand have available acts, policies, plans, adaptation guidance and case law

decisions. The five key acts underlying all formal decision-making processes with regard to adaptation are the Resource Management Act (RMA, 1991) including the Resource Management Amendment (Energy and Climate Change) Act (2004), the Local Government Act (LGA, 2002), the Building Act (2004), the Civil Defence Emergency Management Act (CDEMA, 2002) and the Health Act (1956). The key legislative instrument as part of the RMA relevant to coastal climate change adaptation is the New Zealand Coastal Policy Statement (Department of Conservation, 2010).

In New Zealand, Regional Policy Statements, Regional Plans, and District Plans further devolve legislative adaptation imperatives to the regional and local level. The regional level, in the case of this thesis the Waikato Regional Council, is tasked with managing resources and well being sustainably⁵⁶ at regional level, which includes regional emergency management and civil defence preparedness (Department of Internal Affairs, 2011).

The local council, in this case the Thames Coromandel District Council, is tasked with leading and representing local communities and “promot[ing] the social, economic, environmental and cultural well-being of communities, now and for the future”. (Local Government Act 2002, section 10 [b]). As consent authorities, both the regional and local council have direct influence on the location of activities, resource use, and allocation. This has the potential to reduce risks and promote adaptation. Powers in policy and planning represent the key through which councils approve and regulate third-party development as well as council infrastructure and maintenance, particularly within the coastal zone. Indeed, land-use planning stands out as the single most effective approach to not only risk reduction (IPENZ, 2012; Mileti, 1999) but also sustainability (Healey, 2007; Owens & Cowell, 2010) and

⁵⁶ In line with New Zealand’s Resource Management Act (RMA) which represents a “key tool in the pursuit of a clean, healthy and unique environment, sustaining nature and people’s needs and aspirations” (MFE, 2006, p. 6).

resilience (Davoudi, Brooks, & Mehmood, 2013). In order to reduce risk, address sustainability, and manage resilience, councils, coastal managers and planners have guidance documents, technical manuals, summaries, planning guides and other publications including case studies available to help identify and quantify opportunities and risks that climate change poses (cf. MFE, 2012b).

Emergent from legislation and policy is a mandate to address climate change adaptation, which is primarily undertaken through land-use planning focusing on risk at the local level (where the majority of climate change impacts occur). This is not a simple choice as such. Presently, the question of how communities can be transformed from where they are now to where they need to be must be addressed. Anticipated climate change is projected to result in expansive consequences for coastal properties and infrastructure (MFE, 2008c; Nicholls & Cazenave, 2010; Winter, Sterl, Vries, Weber, & Ruessink, 2012). In other words, proactive planning in the face of climate change requires a holistic understanding of future community needs. By nature, this is a moving target, yet even under the premise of a static line, decisions continue to be made that will result in increased exposure and consequently risk (IPENZ, 2012). 'Business as usual' appears to continue despite a legislative framework intended to encourage sustainability and reduce natural hazard risk. Alarming, the status quo is set against the fact that there is striking agreement (97-98%) among climate scientists with the tenets of climate change outlined by the IPCC (Anderegg, Prall, Harold, & Schneider, 2010). A question society therefore has yet to answer is at what point human settlements become unfeasible (i.e. natural hazards such as coastal inundation become too frequent and impacts make living in exposed areas impossible).



Figure 3.2: “Planning in the face of power⁵⁷”: Coastal canal development on Whitianga’s flood delta (photo by *Hopper Developments Ltd.*, 2011).

However, by understanding the complex local planning reality and investigating how adaptation and hazard management risk are dealt with, future challenges can be managed adequately. Nonetheless, and as this work demonstrates, a complex local reality is enhanced by scientific uncertainty and socio-political ambiguity (resulting in a myriad of adaptation interests) (Renn, 2008; Renn, Klinke, & Van Asselt, 2011). If the issue of climate change were taken seriously there would be no gaps in planning, as identified in a review of 57 adaptation plans from the United Kingdom, Australia, and the United States (Preston, Westaway, & Yuen, 2011). Furthermore, territorial and regional authorities would deploy guidance publications more efficiently and consider the broader governance context in which adaptation takes place more accurately (*ibid.*).

In the following section, I examine planning’s roles and responsibilities when it comes to climate change adaptation; I explain how planning aspirations are interpreted locally, the discipline’s relationship with political ecology, as well as how climate change adaptation fits into the wider planning picture.

⁵⁷ Taken from John Forester’s (1989) book with the same title in which the author takes a practical approach to improving planning practice by closely paying attention to power imbalances .

3.3 From policy rhetoric to local planning reality

No problem can be solved from the same level of consciousness that created it.

—Albert Einstein

Significantly, a definition of planning is not posted on the New Zealand Planning Institute (NZPI) website. The Australian Planning Institute (PIA, 2013, Introduction section, para. 1), defines planning as the process of making decisions to guide future actions:

[Planning] is specifically concerned with shaping cities, towns and regions by managing development, infrastructure and services.

The Canadian Institute of Planners (CIP, 2013, Introduction section, para. 1, quotation marks in original) goes into little more detail and attributes certain values and reasons for planning in its definition:

“Planning” means the scientific, aesthetic, and orderly disposition of land, resources, facilities and services with a view to securing the physical, economic and social efficiency, health and well-being of urban and rural communities.

In other words and put simply, planning is about integrating and translating knowledge into practice (Davoudi, 2010; J Friedmann, 1998). As such, planning influences and regulates activities and humans within the spatial realm. Planning for adaptation is fundamentally about decisions about who should be doing what more, less, or differently, and with what resources to anticipate and respond to

climate change and foster sustainability (Biesbroek, Swart, & van der Knaap, 2009; H. Campbell, 2006; Davoudi et al., 2010; Füssel, 2007, p. 268).

However, planning is fraught with controversy, fragmentation and heterogeneity. Luuk Boelens (2010, p. 1), for example, makes reference to a house in southern Germany with the striking inscription “Gott schütze uns für Gewitter, Ungerechtigkeit und Planer” [*sic*] (God protect us from thunder, injustice, and planners). Boelens (*ibid*) points out how this inscription marks a general distrust in planning which, not least, is a legacy of controversy, fragmentation and heterogeneity. One aspect of this is that, over time, planning has undergone a variety of “fashions”. The most significant shift that has taken place recently is from regulatory to spatial planning (Albrechts, 2004; Allmendinger & Haughton, 2009; Haughton, Allmendinger, Counsell, & Vigar, 2010). Current planning controversies are mainly centred on land-use priorities serving short-term growth, which represents a direct contradiction to climate change adaptation, which seeks long-term land use approaches. According to David Walters (2007), at this point in time, planning can be divided into six main typologies: traditional or comprehensive planning, systems planning, democratic planning, advocacy and equity planning, strategic planning, and environmental planning.

As such, planning provides frameworks based on a wide set of disciplines (E. Wilson & Piper, 2010) implemented within a local context (Cheng & Daniels, 2003). Many professions have a role to play in the practical implementation of measures that amount to adaptation. These include engineering, emergency management, community, and various branches of planning, including land-use, urban, regional, environmental, and transport planning. Given that climate change escalates risk by exacerbating short-term hazard risk as well as slow-onset disasters such as sea level rise, contributions from the planning discipline cannot be seen in isolation. Furthermore, planning has strong ties to disciplines such as geography, anthropology, sociology, and psychology. For example, the academic publishing company Elsevier manages a *Geography, Planning and Development* portfolio, both

anthropology as well as sociology study populations, their relationship to land, resources and how these are shaped by social, economic and political factors, and a major part of psychology is to study how people and their emotions are influenced by their (planned) environment. In essence, planning has been and continues to be influenced by a wide range of disciplines and schools of thought. A seminal reference in this regard is John Friedmann's *Planning in the Public Domain* (1987). Friedmann poses the question why there remains no formal definition of planning, which the author revisits and discusses in a paper under the title *Planning theory revisited* (1998). Friedmann explores four possible answers:

[T]he problem of defining planning as an object to be theorized; the impossibility of talking about planning disconnected from actual institutional and political contexts; the several modes of doing planning theory and the dilemma of choosing among them; and the difficulty of incorporating power relations into planning discourse.

However, as mentioned, the nature of spatial planning is concerned with both the qualities as well as the management of space and place (RTPI, 2012). This shift, in many ways, can be described as a shift from 'hard' to 'soft', and from 'formal' to 'informal', (Allmendinger & Haughton, 2010, p. 809). Put differently, a rigid structure and closely followed procedures, conventionally intended to reach a predefined goal give way to a more fluid and informal approach in which culture, society, nature, interpretations, perceptions, value systems, ethics, take a more central role. For example, in *The New Spatial Planning* (2010), planner and environmental manager Graham Houghton, et al. (see also Allmendinger & Haughton, 2009) draw attention to soft spaces, fuzzy boundaries, and metagovernance. The authors refer to planning taking place outside the formal and regulatory hard infrastructure within the planning system. This approach underlines the shift described above and makes planning, together with political ecology, all the more relevant with a strong potential for contribution to the framework to diagnose barriers to climate change adaptation introduced later in this chapter.

Places go far beyond a mere geographical location but are made up of people, social-ecological systems, genius loci or the spirit of a place, communities, and a myriad of distinct factors which make places what they are. Attention to space and place, land-use practices and human activities, all governed by politics, arguably creates a synergy of planning and political ecology. Given that interests are spatially manifest in patterns of ownership, rights and, in most cases, a sense of belonging or identification, a focus on spatial dynamics as part of the soft infrastructure against the background of politics is inevitable.

In the late 1990s, “new ideas about public argumentation and communicative policy practice” emerged which essentially resulted in a transformation of planning from a technocratic application to a more ‘organic’ way of process-driven spatial planning (Healey, 1996, p. 217). As a logical consequence, this has resulted in a shift towards communicative/participatory planning⁵⁸. Urban planner Patsy Healy, as one of the most prominent scholars in this domain, substantiates such a shift as a result of a “general loss of confidence in political systems” (2003, p. 217). Environmental policy researcher and planner Marcus Lane (2005, p. 283) highlights “the definition of the planning problem, the kinds of knowledge used and planning practice, and the conceptualisation of the planning and decision-making context” as decisive factors when it comes to public participation resulting in an emergence of ‘soft spaces’. Allmendinger and Haughton (2009, p. 619, quotation marks in original) define this shift as follows:

[Communicative/participatory planning is an] important trend, which alongside the tactical use of ‘fuzzy boundaries’ is related to a policy impetus to break away from the shackles of pre-existing working

⁵⁸ The participatory communicative turn in planning theory essentially refers to an acknowledgement of different forms of knowledge (Meppem & Bourke, 1999). Included are aspects of local empowerment, participation and partnership and socially constructed identity to which power relations are fundamental (Allmendinger & Tewdwr-Jones, 2002; Healey, 1996; P. A. Walker & Hurley, 2004). The participatory communicative turn in the planning discipline is referred to as *deliberative planning* in US literature (Forester, 1999) and *collaborative planning* in the UK literature (Healey, 2006). Public debate, social justice and sustainability have become manifest in this aspect of planning (Haughton et al., 2010; Healey, 2007; Innes & Booher, 2010).

patterns which might be variously held to be slow, bureaucratic, or not reflecting the real geographies of problems and opportunities.

The authors conclude that planning requires frameworks capable of working with and through varying institutional boundaries. While such a framework must span the spatiotemporal domain, “and come together in particular local places at particular moments” (ibid., p. 632), it must also acknowledge the soft infrastructure fundamental to political ecology. As such, the process dimension complements the spatial dimension, both of axiomatic concern in the context of adaptation.

However, despite the promise of an increased effectiveness and awareness of the importance of ‘softness’ within planning, the planning discipline has yet a long way to go in a shift from its “traditional focus on exclusion and enclosure” (Gunder & Hillier, 2009, p. 21). For example, town and regional planner Heather Campbell (2002, p. 282) highlights that this traditional focus has led to a past which haunts planners and seems “to have frightened us intellectually and allowed laziness in practice – an attitude reflected in a ‘let’s follow the rules and not take responsibility beyond that’ approach”.

Notwithstanding, a shift towards communicative/participatory planning reflects an attempt to separate the realities of power and inequality in the planning domain. Flyvbjerg (1998) highlights that the core reason behind participation processes is to make power relations both more transparent and easier to regulate, while Huxley and Yiftachel (2000) see the communicative/participatory turn more as a search for the right decision-rules. What gets overlooked, however, is that power is an inextricably enmeshed factor within planning (McLoughlin, 1994). Planning theorist John Forester’s *Planning in the Face of Power* (1989), and even more so *Critical Theory, Public Policy and Planning Practice* (Forester, 1993) examine the constraints of social structure against the background of power and their implications for planning outcomes. Interestingly, similar to planning, describing or outlining power, as sociologist Robbie Pfeufer Kahn (1988, p. 363) points out, “is anything but easy”

due to not only the lability of the concept (Wrong, 1979), but also the “essentially contested” definition of power (Lukes, 1977, p. 4).

Fundamentally, adaptation goes “beyond the availability of appropriate policies, technologies or funding”, thus making adaptation inherently political (Artur & Hilhorst, 2012, p. 529). Within adaptation literature, the significant influence of politics is advanced by Adger, Arnell and Tompkins (2005b, p. 83). The authors confirm that “the legitimacy of adaptation decisions by governments rests on the authority of the information in the political sphere and on the legitimacy of the instruments of policy”. Political scientist Thomas Bernauer (2013, p. 1) further identifies that “while humanity stands on the edge of disaster, the main problem is a political one”.

Again, similar to political power as described above, the causal arrow goes both ways: as much as politics has a bearing on climate change, climate change influences politics. In *Climate Change Politics* (2012), science communicator Anabela Carvalho and environmental policy communicator Tarla Peterson investigate the ways people’s sense of engagement is influenced by climate change, the way political identities develop and are shaped by climate change as well as how communicative practices are influenced not only by what climate change means but also the relationship between politicians and the public. Interestingly, the more individuals trust politicians and the political system, the lower their climate change concerns or any attempts to address the issue (Vainio & Paloniemi, 2013). However, this is likely to change as climate change increasingly demands action, as demonstrated by US President Obama’s recent practical advancement of climate change adaptation through the creation of seven regional “climate hubs” to help farmers and rural communities “respond to the risks of climate change” (Davenport, 2014, para. 1)

Ultimately, power represents the ability to influence people’s behaviour and therefore represents an axiomatic part of a scalar shift (Jessop, 2000). Forester

(1989, p. 28) points out that planners have little power in influencing where power is to be found, however planners “can influence the conditions that render citizens able (or unable) to participate, act, and organize effectively regarding issues that affect their lives”. Put differently, planners have the ability to influence democracy through attention to political power and, as such, hold indirect power over the common good. Indeed, through political power positions of governance are achieved, which, in turn, through planning, influence the common good (Storper, 2001). And the common good, Campbell (2002, p. 281) highlights, “is about more than the collection of common interests”. It is also about how something that benefits society as a whole can be shared. Conclusively, climate change adaptation too is about the common good and it is governed by power and politics, thus confirming the relevance of the key factors introduced here.

Within the social sciences, much has been written about power as the ability to influence people, whether as constraint on human action or the exact opposite: making actions possible. The definition is, indeed, contested⁵⁹, and, again as Pfeufer Kahn highlights, agreement only exists “over the realization that power has not been understood adequately” (Runciman, 1963, cited in Pfeufer Kahn, 1988, p. 363). However, while I am aware that discussing power and different philosophical discourses on power is fundamental to all of the social sciences, I must accept that an in-depth theoretical discussion would go beyond the scope of this thesis. It is noteworthy that the concept of power, until recently, has remained absent in resilience (Berkes, 2007) and adaptation discourse (Adger, Arnell, et al., 2005b). There is a potential for political ecology to give voice to power and for planning to open avenues and ‘em-power’. Power includes “[t]he rhetorical weight of policy

⁵⁹ To Sociologist and philosopher Jürgen Habermas, a definition of power depends on the point of entry or method. In other words, power is defined differently if viewed from, say, a “class paradigm” or an “organisational paradigm” (Pfeufer Kahn, 1988, p. 365). According to philosopher Michel Foucault who, in line with Niccolò Machiavelli, claims that power is productive and, particularly when it comes to barriers such as the adaptation barriers discussed in the following section, power can prove decisive. Foucault describes power as “a complex strategic situation in a given society (social setting)” (1980, p. 93). Habermas on the other hand, in line with Marx, argues that power as such does not exist due to the fact that “man is not an abstract being squatting outside the world ... [m]an is the human world” (Avineri, 1975, p. 77, cited in Pfeufer Kahn, 1988).

argumentation, the presentation of evidence, persuasive language, claims of scientific authority”, together shaping what is defined as discursive power (Springate-Baginski & Blaikie, 2007, p. 6). Power further includes “means by which knowledge is produced and disseminated” which, in turn, has an influence on policy and practice and consequently the value attributed to resources resulting in a messy reality of resource control, use and access shaped by according interests (ibid., p. 6).

Planning can make it possible to translate the critique of political ecology (limited practical application) into practice and advance adaptation (Hurlimann & March, 2012; Measham et al., 2011; Tribbia & Moser, 2008; E. Wilson, 2006). Planning is a way of “critically thinking about space and place as the basis for action or intervention” (RTPI, 2012, p. 2). Of the many frameworks set by planning, an adaptation point of entry appears auspicious. At first glance, planning takes over where political ecology comes to its limits. The Stern Review (Stern & Treasury, 2007) distinguishes adaptation as decisive within the discipline’s challenges. The potential of planning within policy responses represents a key tool in shaping development “vulnerable to climate risk today and in the future” (Stern & Treasury, 2007, p. 477). Adaptation within the planning discipline has resulted in increased recent scholarly focus. While Harriet Bulkeley (2006) underlines the importance of environmental aspects of adaptation planning to represent a pivotal role, Elisabeth Wilson (2006) argues that wider (environmental) implications of climate change adaptation are not (yet) included in planning.

In Adapting to Climate change at the Local Level: The Spatial Planning Response, Wilson (2006) reviews a shift in planning policies in the UK and argues that there remains a lack of political support and a lack of practical engagement of the planning profession in regard to adaptation. This confirms a point made by Ian Burton and Maarten van Aalst (2004) who argue that the planning discipline traditionally approaches climate change through expert-organised disaster management with a focus on hazard and risk. Wilson (2006, p. 623) finds that the

conception of climate change itself has a lot to do with this and argues that the way climate change is framed is decisive:

Local planners' perceptions of the uncertainty surrounding climate change may be reinforced by lack of knowledge of precise impacts at the local scale, and an expectation that such issues are better, or more appropriately, resolved at the more strategic or regional level.

Davoudi, et al. (2010) find that awareness of the complexity, uncertainty and irreversibility of climate change and the implications for adaptation is accumulating the expectation for the planning discipline to contribute in adaptation. Consequently, planners are increasingly on the outlook for how to incorporate adaptation into existing processes and create policy frameworks enabling the reinforcing of existing infrastructure and enhancing the protective function of ecosystems (D. King, 2004; R. J. T. Klein & Tol, 1997; Sperling & Szekely, 2005; UN/ISDR, 2004).

However, Heather Campbell (2006, p. 201) concedes that the wicked climate change problem "can feel like an issue that is too big to handle ... as a spatial planning community". In referring to Harriet Bulkeley's (2006) highlighting of the importance of environmental concerns, Campbell (2006, p. 202) points out how planning in the face of climate change "becomes a mechanism not for action and change but rather a site of contestation between a dominant agenda of economic growth and a less powerful discourse of environmental concern".

In their book *Land and Limits: Interpreting Sustainability in the Planning Process* (2002), environmental governance researcher Susan Owens, together with environmental policy researcher and planner Richard Cowell explore the impact of sustainable development. Not only do the authors argue that incorporating environmental concerns and a shift toward sustainability remain ubiquitous, but that moral and political choices are paramount. With regard to climate change and planning, Owens and Cowell describe an "implementation deficit" (p. 25). This has

prompted Bulkeley to describe climate change concerns being confined to rhetoric within the planning community (2006), evident in a prevailing adaptation fatigue.

Nonetheless, using the UK as case study example, Bulkeley describes a shift following Owens and Cowell's (2002) publication. Bulkeley refers to good practice guidance published by the UK government (ODPM, 2005, p. 13, emphasis added) stating the necessity to address "the causes and *potential impacts* of climate change". Whether the UK's ambitious resolution of "urgent action", as stated on its website under the Planning, Building and Environment section (Department for Communities and Local Government, 2012, para. 3), will be tackled and entrenched drivers of unsustainable practices overcome, remains to be seen. A recent change in mood is certainly noticeable as adaptation is rapidly gaining public and policy attention, as emphasised in a review of seven national adaptation strategies by Robbert Biesbroek, et al. (2010). The authors note that most adaptation strategies refer to planning as the discipline in charge of adaptation. This recent shift further emphasises the planning discipline's relevance in this comparison with political ecology. The question yet to be answered is whether adaptation planning's potential will be translated into action.

An issue often overlooked, as argued by geologist and planner Philipp Schmidt-Thomé and planner Johannes Klein (2011), is that human settlements are often located in already hazardous locations for a variety of reasons. The authors (*ibid.*, p. 177, emphasis added) argue that while planning *could* be very useful in taking adaptation forward, the true potential is seldom applied or it is overruled by other priorities. Using the Baltic Sea Region as case study, in which Schmidt-Thomé and Klein find that while there is sufficient information at hand to take matters forward, there is need for a societal debate. Planning can provide the forum and rationale for such public debate about the risks we are willing to take and what the level of acceptable risk is. Planner Jörn Birkmann and geographer Korinna von Teichman (2010) examine the connection between disaster risk reduction and climate change adaptation against the background of sustainable development. The authors

examine practical barriers and conclude that emerging challenges can be broken down into issues regarding scales, knowledge and norms. Addressing the level of acceptable risk, reducing risk and building resilience, Birkmann and von Teichman (ibid.) point out, are consequently not only imperative when it comes to climate change adaptation but also when setting a societal development trajectory. In other words, regardless of climate change, the key lies in sustainability and addressing climate change adaptation has become implicit in sustainability. A coastal community, for example, elevated and removed from existing coastal hazards is far less vulnerable to amplified coastal hazards resulting from climate change and therefore more sustainable.

Yet, how could such sustainable planning and development be achieved and what is keeping planners from making meaningful adaptation progress? According to environmental planner Jeff Howard (2010) there is an urgency for planners to counteract a certain historical culpability, which, arguably, can only be achieved through an approximation of rhetoric and reality and by answering Schmidt-Thomé and Klein's question of acceptable risk by means of societal debate. In order to bridge the rhetoric – reality dichotomy, good intentions must be translated into practice, which represents a real challenge (Bulkeley, 2006, p. 2010). Wheeler (2010, p. 22) highlights that “climate change planning in virtually every jurisdiction is hamstrung by questionable political commitment, public understanding, and resource availability”. For this reason, Wheeler (ibid.) argues, a novel conception of planning capable of addressing adaptation and sustainability challenges is required. Through a re-conceptualisation, planning has the *potential* to take its place in leading this effort and be mainstreamed in social choices and sectoral initiatives. Yet for this to happen, the concept of sustainability must be translated into practice and policy. Planning, after all, is (only) one aspect within social-ecological systems and the challenge is to not only rethink current practice but to narrow the prevailing gap between policy and practice.

Not only a lack of political support but a fundamental discrepancy between short-term interests pursued by local plans and the long-term implications of climate change is what environmental policy researcher Elisabeth Wilson (2006, p. 609) identifies as key reasons for why adaptation remains incipient. Indeed, as Anna Hurlimann and Alan March (2012) highlight with regard to the long-term climate change implications, “[t]he interests of future generations... are largely unrepresented in processes of planning..., thus their interests are not reflected in [adaptation] plans and decisions” (J. O’Neill, 2001; Paavola & Adger, 2006). Matters are unlikely to change as long as equitable processes and outcomes are not facilitated and planning processes addressing underlying drivers of sustainability are not addressed. As I demonstrate in Chapter Eight, this is particularly evident in a negligence in addressing adaptation in local and regional plans (Hurlimann & March, 2012).

As it stands, neither political ecology nor planning appear to be ‘up to the task’ given the shortcomings in both scholarly arenas. The fact remains, that a persistent adaptation deficit remains in place (Burton, 2004, 2009). What is more, planning discloses difficulties in coming to terms with what I have defined as soft infrastructure: human behaviour shaped by interpretations, perceptions, value systems, ethics, culture, and politics and what fundamentally represents the “conjuncture of culture, society and nature” (Oliver-Smith, 2004, p. 11). In the broader sense, much work remains to be done to bridge the gap between what is being said and written and local reality on the ground. While planning provisions might be technically sound, the challenge remains in making it happen in the real world. One such practical approach (taken up by this thesis) is to examine adaptation barriers in place and ask the questions of not only which barriers need to be overcome but also why barriers are in place in the first place. Such a practical approach, primarily, requires a framework which I introduce, discuss and develop in the following Chapter Four.

4

A framework to diagnose barriers to climate change adaptation

It is through ... testing that the usefulness of a systematic diagnostic framework of adaptation barriers can be shown and improved.

— Barriers to Climate Change Adaptation (Ekstrom et al., 2011, p. 57)

The foregoing review of literature from political ecology and planning has demonstrated that climate change adaptation is not receiving the attention required for sustainable development and called for by the science community. Climatologist Kevin Trenberth (2011, p. 214) notes that while “one would suppose that at least society would plan sensibly for the changes already happening and projected, [but] such future adaptation plans are also largely in limbo”. The question therefore becomes precisely *why* ‘business as usual’ remains the order of the day and are there contributions from the wider adaptation literature that can assist in finding an answer to this rather unsettling question?

Current thinking and research on adaptation barriers is reflected in a framework developed by geographer Susanne Moser and adaptation researcher Julia Ekstrom (2010). Moser and Ekstrom’s paper, published in the *Proceedings of the National Academy of Sciences*, is persuasive by argument and supporting literature and presents a cogent framework for addressing the adaptation barriers aligned with

the notion of prevailing 'business as usual'. At the time of writing, 75 publications have cited this paper and, together with ecologist and biogeochemist Margaret Torn, the authors have since published the framework as a *Public Interest Energy Research* report called *Barriers to Adaptation: A Diagnostic Framework* for the California Energy Commission (Ekstrom et al., 2011). The authors not only offer a set of barriers but bring attention to the relationship and interplay between the different factors, such as actors, context, and the system of concern and how these contribute to the existence of barriers. The article uses the logic of a rational planned adaptation process and locates the issue of climate change adaptation in the context of wider governance and societal context with different actors and different systems of concern. Put simply, the framework by Moser and Ekstrom (2010) is ideal for making sense of and identifying adaptation barriers. Despite not specifically referring to political ecology, the framework (ibid.) serves as auspicious foundation on which to advance thinking and understanding that incorporates insights from both political ecology and planning in the real world context. By drawing on the framework, I also address weaknesses including insufficient attention to cultural and political spheres, a stronger need for local focus, an incapability of political ecology to guide adaptation practice, an inadequacy in incorporating adaptation into policy-making, an apparent powerlessness of the planning discipline to address adaptation constructively through sustainability pathways, as well as an overall lack of emphasis on adaptation.

I discovered the framework by Moser and Ekstrom (2010) only after having completed the fieldwork; otherwise barriers would have been an even more distinct aspect in the research approach and interview process. The core reason for why this framework has become highly relevant, is that barriers to climate change adaptation emerged from the interviews and observations until, metaphorically, they stood out like a sore thumb. A further key point for making use of the framework, other than the above mentioned, is that it mirrors the local reality reflected in the stories told by those interviewed. To my knowledge, no other non-normative framework that takes into account the actors, context, and system of

concern has been published to date. The framework's only weakness represents a strength at the same time: the framework represents a starting point for a practical approach to adaptation which means that there is no, and there cannot be, a fixed, one-size-fits-all prescription for overcoming barriers. The framework represents a practical approach "for answering critical questions that can ultimately inform and benefit climate change adaptation at all levels of decision-making" (Moser & Ekstrom, 2010, p. 22031). However, before I discuss the framework in more detail, I clarify the definition of barriers to adaptation in the following subsection.

4.1 Adaptation barriers: a definition

Adaptation literature uses two concepts with regard to obstacles, sometimes together and sometimes interchangeably. The definition of adaptation barriers used here is consistent with Moser and Ekstrom's (2010) use of the concept. The authors adopt their definition from the Intergovernmental Panel on Climate Change (IPCC, 2007a, pp. 733-737). The IPCC defines limits as absolute obstacles in a real sense. As such, limits are immutable thresholds in biological, economic, or technological parameters beyond which activities cannot be sustained (Adger, Dessai, et al., 2009). For example, in biological terms, population genetic factors directly affect the distributional limits of populations limits, as described in a study by Jon Bridle, Sedef Gavaz, and Jason Kennington (2009) who tested the limits to adaptation along altitudinal gradients in rainforest *Drosophila*. Ergo, in this biological limit example, the genetic factors represent the adaptation limits. Another study undertaken by Walther, et al. (2002) exposes a coherent pattern of ecological change across systems. The study shows that climate change adds to detrimental human activities on ecosystems and can push species and ecosystems over their limits. The consequence is not only a loss of ecosystems and species but also implications for socio-economic systems. The authors use North Sea Cod and coral reefs as examples. The conclusion is that climate change fundamentally raises concerns about limits being transgressed. As I have indicated in the introduction, when this

happens and the level of uncertainty coupled with high decision stakes increases exponentially, linear and rational approaches become outdated. This is the point when complex matters resist resolution in the conventional sense and become wicked, as first discussed by Horst Rittel and Melvin Webber (1973).

A complex interdependence further contributing to the wickedness becomes even more obvious when technological innovations contribute to a change in game (Moser & Ekstrom, 2010). For example, by genetically modifying crops and making these less susceptible to, say, diseases, an apparent limit can, for the time being, be overcome. In such a case the apparent limit actually represents a barrier. Adger, Dessai, et al. (2009) point out that it is frequently the case that social limits can be malleable barriers which, at least in theory, can be overcome, provided that there is sufficient political will, social support, resources, effort, etc. For example, a barrier may “*appear*” (Moser & Ekstrom, 2010, p. 22027, emphasis in original) as de facto limit (i.e. a law) but a failure to question a possible transformation of such a barrier represents an obstacle in itself and consequently stands in the way of the adaptation process. In other words, if an apparent limit can be overcome it represents a barrier, but not trying (for whatever reason) to overcome the limit can in itself become a barrier. This barrier was precisely summarised by industrialist Henry Ford when he said that “[m]ost people spend more time and energy going around problems than in trying to solve them”. However, fact remains that neither overcoming all barriers, nor a barrier-free process is guaranteed to result in a successful adaptation outcome. A barrier free process remains a hypothetical construct and outcomes will always require adjustments of some sort and at some point. Ignoring certain best practices as part of the adaptation process (stakeholder involvement, consensus or broad agreement, information, funding, etc.), however, is likely to result in maladaptation.

4.2 A framework to diagnose barriers to climate change adaptation

The systematic framework to identify barriers that may thwart climate change adaptation targets the process of *planned* adaptation (Moser & Ekstrom, 2010). The framework 'sets the scene' for addressing the vexatious situation of adaptation by providing a starting point for answering vital questions and clearing the way for practical steps forward. In this thesis, I bring political ecology and planning to the framework. Political ecology brings an appreciation of the various aspects of social life I refer to as soft infrastructure. Moser and Ekstrom (2010) further identify leadership, strategic thinking, resourcefulness, creativity, collaboration, and effective communication as essential to overcoming barriers yet fail to provide insight into how adaptation is politicised.

The adaptation landscape is a far cry from a level playing field. Political, social, and economic discrepancies mirrored in fundamental economic inequalities, result in disparate costs and benefits of any adaptation outcome. For example, wealthy beachfront property owners are in a stronger economic position to protract coastal erosion, while protection efforts in lower economic beachfront locations are more likely to be evidently maladaptive or abandoned altogether. In a case study research coupling economic and physical models along the US east coast, environmental scientists McNamara, Murray and Smith (2011) demonstrate that when the costs of artificially nourishing beaches rise due to a depletion of sand resources, "coastline change is tied to the interaction between patterns of erosion and property value" (p. 1). Decision-makers would be best informed about how to overcome adaptation barriers, if the complexities of socio-ecological systems, including the political environment, economic pressures and equalities, and societal regulations were included into a framework. As it stands, this initial situation is not considered in Moser and Ekstrom's (2010) framework, yet it is fundamental to political ecology. For this reason, bringing political ecology to the framework further

represents a promising approach to highlighting the dynamics of the social factors crucial to any adaptation outcome and how they are shaped.

What is more, by explicitly bringing the planning discipline to the framework, I call attention to the roles and responsibilities of different actors when it comes to resource use. Particularly with regard to the local scale, at which adaptation takes place, planning adds the critical dimension of how to practically configure adaptation and how to address the aforementioned implementation deficit. However, as I have explained in this chapter, there is no planning or political ecology framework designed to identify barriers to climate change adaptation. For this reason, I propose a conjunction of adaptation approaches from within the planning discipline, the political ecology arena and the framework developed by Moser and Ekstrom (2010).

Three key sets of components provide the foundation for the framework developed by Moser and Ekstrom (2010): The first is the process component which represents a staged depiction of an idealised and rational approach to adaptation decision-making (Figure 4.1), and the second is a set of interconnected structural elements including the actors, the system in which they act (i.e. governance) and the object upon which they act (the system of concern exposed to climate change and confronted with adaptation, in the case of this thesis these are the coastal communities). The third key set of components contributing to the framework is a matrix enabling the location of intervention points in order to overcome given barriers (Figure 4.2). Moser and Ekstrom's framework is guided by four principles shaping it to be (1) socially focused but ecologically constrained; (2) actor-centric but context aware; (3) process-focused but action/outcome oriented; and (4) iterative and messy but linear for convenience (Ekstrom et al., 2011).

The part of Moser and Ekstrom's framework of strongest practical relevance for the context of this thesis is the process component of adaption, as shown in the following Figure 4.1. The three case study examples (in the following four chapters)

are based upon this process component. The practical relevance is reflected in the barriers encountered in the phases and subprocesses within the adaptation process. Nonetheless, in order to overcome barriers by addressing opportunities for influence and intervention, a further part of the framework (in the form of a simple matrix) is also crucial. This matrix will be discussed in this Chapter's following section, after which I discuss an adaptive social-ecological governance approach for this research which fundamentally incorporates both the political ecology and planning rationale. Before doing so, I discuss the process component of adaptation as part of Moser and Ekstrom's (2010) framework in detail in the following subsection.

4.2.1 The process component of adaptation

The identification and organisation of barriers is based on the process of adaptation. Moser and Ekstrom (2010) use the common process phases of a rational decision-making process (understanding, planning, managing) which include a total of nine stages (Figure 4.1). In each stage, potential barriers are identified. If, in the real-world context, stages are skipped, consequential barriers can stand in the way from one stage to the other. For example, if options for protecting the coast from erosion are not assessed thoroughly and an *inappropriate* option is selected (i.e., a hard defence structure which deflects the problem and results in maladaptation, as I discuss in the subsequent case study chapters), consequential barriers will prevent an implementation of the subsequent barriers.

The stages which form the Understanding Phase (Figure 4.1) include the detection of the problem (i); the gathering and use of information (ii); and a (re)definition of the problem possibly requiring a decision (iii). The Understanding Phase is applied to each case study example (Chapters Four, Five, and Six). The figures provide an overview of the stages and the possible barriers. Adaptation barriers are introduced in each of the following chapters. The according figures serve as an illustration of

precisely which part of the adaptation process is being referred to. In the Planning Phase adaptation options are developed (iv); options assessed (v); and option(s) selected (vi). The Management Phase requires an implementation of the option(s) selected (vii), monitoring of the environment and the outcome of the option(s) implemented (viii); and evaluation (ix). Moser and Ekstrom point out that in reality the decision process is not as linear and neat (Cohen, March, & Olsen, 1972; Lindblom, 1959; Mintzberg, Raisinghani, & Théorêt, 1976) yet, for the purpose of the framework, provides a useful ordering heuristic.

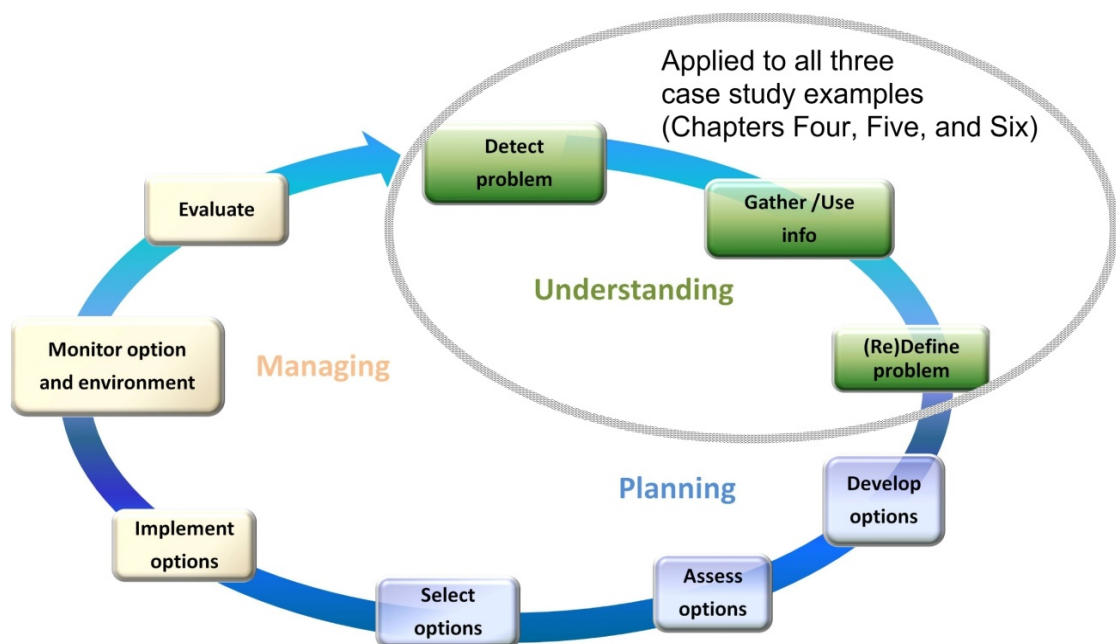


Figure 4.1: Phases and subprocesses throughout the adaptation process (after Moser & Ekstrom, 2010).

Given that this framework was included in this thesis at a later stage of the research process, I would not do the narratives justice by forcing them into every part of the framework. For this reason, I concentrate on the 'higher level' of the process component, namely understanding, planning, and managing with a degree of flexibility with regard to the subprocesses. For example, in the discussion of how climate change and adaptation are understood in the local context, I focus not only on decision-makers involved in the process of planned adaptation, but on all stakeholders involved.

As pointed out earlier in the discussion of why political ecology is so important for this work, it is essential to situate human actions within the processes of climate change. Arguably, the way and the degree to which the problem is understood from everyone affected will have a bearing on adaptation decision outcomes. Locals are, and will be, affected by climate change in different ways resulting from political, social, and economic discrepancies. The lack of knowledge about how those affected feel about an adaptation option selected (i.e. a coastal defence structure such as a sea wall), represents a barrier in itself. Fundamentally, this barrier then stands in the way of the adaptation process advancing to the Management Phase in which the selected option becomes implemented, monitored, and evaluated. Furthermore, instead of ordering participant insights with the respective barriers in each phase identified by Moser and Ekstrom (2010) and breaking up the stories and insights, I structure insights according to the phases. Consequently, barriers remain implicit in the stories told but justice is done to the coherence of the insights.

4.2.2 Interconnected structural elements of adaptation

In order to understand why barriers arise in the adaptation process, Moser and Ekstrom (2010) build on a framework developed for the analysis of social-ecological systems (Anderies, Janssen, & Ostrom, 2004; Ostrom, 2007). This framework distinguishes between actors which are not prescribed or static, the larger context in which they act, and the object upon which they act (representing the system in need of management and/or transformation). In the context of this thesis, the focus does not lie solely on the system in need of management and/or transformation such as beachfront properties. Rather, I assess what action needs to be taken in order to change the initial situation. For example, how do the attitudes and actions of those who own beachfront properties have to change – what must happen to their thinking, their values and/or their practices? The same question can be asked with regard to other stakeholders such as planners, policy-makers, councillors,

politicians, or the media, to name but a few. I gauge the answer to this question through individual insights, perceptions, and values with regard to climate change and interactions with different levels of governance (i.e. local and/or regional council).

Moser and Ekstrom (2010) point out that actors may only make the changes required if the governance context in which individuals act also changes such as through law changes (i.e. coastal set-back regulations). The larger context in which both the actor and the system in need of management and/or transformation are embedded sets the conditions responsible for shaping adaptive behaviour, practices and actions. Summarised, the larger context is decisive in determining whether adaptation is enabled or constrained.

Stage-specific barriers are identified by asking the question what can stop, delay, or divert the adaptation decision-making process. The source of the barriers is established through the structural model by asking what causes the impediments and how the actors, the context, and the system of concern contribute to the barriers. In line with Moser and Ekstrom, I discuss the third step of the framework, the matrix enabling the location of intervention points in order to overcome given barriers, after the initial diagnosis (see Figure 4.2).

4.2.3 The identification of barriers throughout the adaptation process

Even if the necessity to adapt is evident, the actors, the governance system, and the larger socio-economic as well as social-ecological context determine if and to what degree the problem is detected. Problem detection represents the first stage of the Understanding Phase as part of the adaptation process. For example, if the climate change signal⁶⁰ is not directly perceived⁶¹ or filtered out by the actor's 'mental

⁶⁰ The IPCC's Working Group 1 Second Assessment Report (1996) noted that "the detection and attribution of anthropogenic climate change signals can only be accomplished through a gradual accumulation of evidence" (Mitchell et al., 2001, p. 697). A scientific detection of a climate change

model', which is essentially a subjective image of the surrounding world (Bless, Fiedler, & Strack, 2004), or the actor is too busy or otherwise occupied, the problem will not be understood. By default, the mental model filters certain signals because they do not fit into this image or because the individual is too distracted. The insights presented here, however, go beyond a mental model and include the way those interviewed feel, sense, and apprehend climate change emotionally as part of a lived experience "in which acceptance, denial, resignation and action co-exist as personal and social responses to the local manifestations of a global problem" (Brace & Geoghegan, 2011, p. 284). The term lived experience describes first-hand accounts and impressions, and as such reflects an expansion of mental models. The lived experience of climate change has received increased research attention in recent years as it describes how individuals, communities and also organisations come to terms and deal with the (local) impacts of climate change (e.g. D. Anderson, 2010; G. Wilson & Nicolau, 2012).

Cognitive biases where individuals create a subjective social reality unrelated to the objective signal undoubtedly play a part. The mental model may include an unwillingness to accept that anthropogenic greenhouse gas emissions have an effect on the atmosphere. If the governance system or media fail to transmit a signal or prevent it from filtering through, the problem will also not be understood.

Research undertaken by Tribbia and Moser (2008) shows that a lack of high level leadership and guidance/governance can have a strong influence on both capacity and willingness to adapt. The authors reveal a strong science/practice disconnect in

signal requires that this is statistically significantly different from a signal produced from natural variability. In the context of this work, a climate change signal stands out from noise, which is natural variability. Given the ethnographic approach taken, this signal is perceived and interpreted on an individual and subjective basis and not necessarily understood universally or beyond context.

⁶¹ Based on work by James J. Gibson (1979; 1982), anthropologist Tim Ingold (2002, p. 40) offers a way out of the "conceptual prison of the nature-culture dichotomy" (p. 40) by proposing an alternative approach to perception. Accordingly, people are able to "acquire direct knowledge of their environments in the course of their practical activities" (ibid.).

the context of coastal zone management and climate change adaptation in California and identify the need for an institution devoted to bringing the two together facilitate adaptation. Vogel, Moser, Kasperson, and Dabelko (2007) ask what credible, legitimate, and salient knowledge is and, using southern Africa as case study, confirm the difficulty in linking science to practice. The authors point out that reconciliation “involves a variety of possible pathways and players, but always depends on a spirit of partnership and perhaps a convergence of interests” (ibid., p. 359). Consequently, there are many variables when it comes to the transmission of a signal triggering a climate change understanding. A further difficulty mentioned by Moser and Ekstrom (2010) could be uncertainty or variability preventing a signal from emerging from the background noise. This could be, for example, highly variable weather patterns in a particular region, such as the Coromandel Peninsula, which would make climatic changes difficult to detect.

Similarly, Moser and Ekstrom (2010) write, barriers can arise from one or all three sources with their framework. The adaptation process will remain stuck in stage one as long as the problem is not detected adequately or accordingly. Again, a climate change signal of some kind must be identified, albeit not by everyone at the same time, in order be incorporated into a practical solution to an existing problem.

The second phase of the rational decision-making process, following the Understanding Phase and the first three subphases (problem detection, gathering/use of information, (re) definition of the problem), is the Planning Phase. At this point of the rational decision-making process leadership, authority, and skill have proven to be crucial. Work by Fikret Berkes (2002), David Cash, et al. (2006), and Claudia Pahl-Wostl (2009) has demonstrated that whether actors are in control of the issue or not and if they are prepared to move beyond their immediate control can prove decisive at this stage. As long as goals and criteria are not agreed upon (which postulates safe spaces for doing so), actors may experience a “significant barrier” (Moser & Ekstrom, 2010, p. 22028). Many of the barriers experienced earlier in the process, Moser and Ekstrom further point out, re-emerge

at this point due to a common failure of separating the careful evaluation of options from the brainstorm which makes the development of options a decisive step in the process.

Different political interests, jurisdictions, and/or funding are likely to result in different controls over and also barriers to the adaptation process. Consequently, the governance system determines who has control over a certain process which in turn has implications for the range of options and outcomes of adaptation planning process and what barriers will or will not be encountered. The range of options and outcomes, on the other hand, are influenced by the system of concern. Moser and Ekstrom (2010) write that, for example, if the system of concern extends across multiple jurisdictions, an implementation of options will require coordination and collaboration across these jurisdictions. If such a coordination and collaboration is not achieved, barriers are the logical consequence.

Following the selection of an option within the Planning Phase, the decision-making process moves into the Management Phase. As it stands only few adaptation processes have reached this phase (Adger, Lorenzoni, et al., 2009; Berkhout, Hertin, & Gann, 2006; Dovers, 2009; Parry et al., 2007). Reasons include the significance of barriers before and in the implementation stage as well as the fact that adaptation has emerged as a relatively recent topic. For this reason, Moser and Ekstrom (2010) draw on experience with other management and change processes to illuminate the Management Phase as part of the adaptation process.

The first process stage within the Management Phase is implementation. The mere intent to implement an option simultaneously represents the first barrier in this phase (Öhlmér, Olson, & Brehmer, 1998; Pieters, 1988). A variety of sub-processes and actors, some of which may not have been included until now, come into play. Implementation, Moser and Ekstrom (2010) highlight, is strongly influenced by actors and therefore requires varying amounts of time, resources, skills and effort. The governance and larger social context, the authors further highlight, plays a

significant role when moving from option selection as part of the Planning Phase to option implementation as the first stage within the Management Phase. This occurs in two separate parts: through the actors' perception, freedom and capacity to do so, and through its impact on the available resources, authorisation, permits, political climate, or social norms. The implementation of an option must take place within the legal framework, unless implementation aims at altering the legal framework.

Moser and Ekstrom (2010) use the example of shoreline hardening to protect the coast from the coast from erosion to illustrate how the existing legal framework can stand in the way of taking action. This example is also highly relevant within the local Coromandel context, as I will discuss in the according case study chapters. Another powerful barrier, Moser and Ekstrom (2010) write, can be past practices and/or how these influence social perception of the past. Such a connection of social identity and historical memory is referred to as social memory (S. A. French, 1995). Simply because issues were dealt with or perceived to have been dealt with in a certain way in the past, the same approach may not be appropriate in today's context. If, for example, shoreline hardening was common practice in the past but has found to be no longer acceptable or sustainable (or has become outlawed) due to its effects on other parts of the coast, it represents a barrier. This could be the case in an environment where the intention is to protect infrastructure from eroding, yet a hard defence would result in permanent high tide beach loss. If the system of concern is physically altered in the course of implementation, as is the case with shoreline hardening, this represents a barrier. Furthermore, if the consequences of implementation are substantial and irreversible, public support and stakeholder acceptance will be lower than if the implementation is flexible and easily reversed (Adger, Brown, & Tompkins, 2005).

Moser and Ekstrom (2010) also highlight the importance of mechanisms to monitor and periodically evaluate both the changing environment as well as the implemented option. Research by McLain and Lee (1996) and Thompson, Robbins,

Sohngen, Arvai and Koontz (2006) substantiates barriers in past adaptive management practices. These include lack of (agreement on) indicators, relevant data, methods, and expertise and their impact on decision-maker (and constituent) reception. Using the example of adaptive management of riparian and coastal ecosystems, Carl Walters (1997) provides a real world confirmation of the above points made by Thompson, et al. (2006) as well as the crosscutting issues discussed in the following section. Walters (1997) highlights the risk of stakeholders regarding adaptive management as a risk to the status quo rather than seeing adaptive management as an opportunity for improvement. Walters writes that there is “much potential for adaptive management in the future, *if* we can find ways around these barriers” (C. Walters, 1997, p. 1, emphasis added).

A logical way of working around or overcoming such barriers and making use of the potential for adaptive management Walters (ibid.) refers to, is to adjust not only the management but also the governance system. After all, what is the point of adjusting one part in a system if the other remains the same? Dissonance becomes the logical consequence. The most obvious solution is to interlink adaptive management with adaptive governance. This point is taken up by social-ecological systems scientist Brian Walker (2012, p. 29), who claims that “adaptive management on its own is almost bound to fail” and that any change in adaptive management has to “co-evolve” with changes in governance.

4.2.4 Crosscutting issues

Certain barriers, including (i) leadership, (ii) resources, (iii) communication and information, and (iv) values and beliefs are of crosscutting and repeated importance throughout the adaptation process (Moser & Ekstrom, 2010). Given this thesis’s combined approach of ethnography and case study, the fourth barrier concerned with local values and beliefs is of particular interest. Nonetheless, as I explain in the following subdivision, the other three crosscutting issues are also very important.

Furthermore, public participation represents an additional barrier of cross-cutting importance. Within the planning discipline in particular, the importance of addressing and overcoming this particular barrier has become evident in the participatory communicative turn, an established key phrase since the early 1990s (i.e. E. R. Alexander, 1997; Mandelbaum, 1996). In the early days of the participatory communicative turn, Patsy Healey (1996), for example, draws attention to the lack of clarity and understanding of how stakeholders have access to the complexities involved in spatial strategy-making; how they agree or disagree with planning decisions made; and, ultimately, what influence they have on the outcome of events. The various 'fashions' I mentioned earlier in this chapter which planning has undergone over time are also evident with regard to this particular aspect. Primarily, different ways this subject has been dealt with over time, can be traced back to the according intellectual schools having an influence on planning theory (Allmendinger & Tewdwr-Jones, 2002, pp. 5-6), including neo-pragmatics (T. L. Harper & Stein, 1995), critical theory (Forester, 1999), Foucauldian perspectives (Flyvbjerg, 1998) and planning practice (Hoch, 1992).

What is more, political ecology fundamentally grapples with the same issues as the theory offers an auspicious understanding of cultural and socio-economic issues as part of "adaptive human-in-nature systems" (Berkes & Folke, 1998; Jentoft, 2007; Mahon, McConney, & Roy, 2008). Anna Hurlimann and Alan March (2012) identify that the consequent challenge from this point of departure lies in transforming planning systems from passive to active, as I have identified in this chapter's Section Two. Consequently, the combination of planning and political ecology inherently connects with all elements of the framework to address adaptation barriers applied here to a particular spatial setting. Of these barriers, the following four, briefly introduced, barriers of cross-cutting importance are of momentous importance.

4.2.4.1 Leadership

Leadership, Moser and Ekstrom (2010, p. 22029) write, “can be critical at any stage in the adaptation process but maybe most important in initiating the process and sustaining momentum over time”. A lack of leadership or even differing notions of what constitutes ‘good’ leadership, Biesbroek, Klostermann, Termeer and Kabat (2011, p. 187) argue, using the example of the Netherlands, “may be a motivational barrier keeping others from engaging in adaptive behaviour”. “When there is no mandate, law, job description, or public demand yet for adaptation planning”, Moser and Ekstrom (2010, p. 22029) write, “leaders are required to initiate the process”. ‘Good’ leaders can be described as champions: they can motivate the majority and make adaptation happen (ESPACE, 2005). The absence of (good) leadership can result in a reinforcement of existing barriers or even the creation of new barriers. “Clear leadership from a chief executive is needed to overcome bureaucratic resistance, turf battles, and risk aversion, especially regarding complex policy problems that cut across conventional agency jurisdictions” (J. B. Smith, Vogel, & Cromwell, 2009, p. 54). Most importantly, however, while leadership has the potential to overcome barriers, the absence of (or ineffective) leadership will result in barriers.

4.2.4.2 Resources

Resources are a prerequisite for effective adaptation (Füssel, 2007; Füssel & Klein, 2004), and are important at every stage of the adaptation process. Insufficient resources (predominantly financial but also human, information, time, knowledge, and technological) represent barriers at every scale and stand in a direct connection with inaction or maladaptation. Biesbroek, et al. (2011) list human, financial, information, physical, and natural resources as adaptation barriers. Tribbia and Moser (2008, p. 324) specify “lack of resources, staff, and time [to] present major hurdles ... to even get informed about [the effects of] global warming...”. If, for

example, local or regional government does not place sufficient resources aside to undertake research into and assess the implications of a rising sea level on a populated and developed coastline, the veritable effects of climate change for this area will remain obscured. Consequently, the level of not only the public but also decision and policy makers and planners and many more who have a local influence will remain embryonic. Moser and Ekstrom (2010, p. 22029) point out that there are “very real limitations to what is possible without resources”. Tribbia and Moser (2008) have found insufficient resources often to be decision-makers’ first response for why adaptation action is not taken. While, on a global scale, it is true that those with the least resources have the least capacity to adapt, in a western and developed context, the allocation of resources is a matter of setting priorities. Put simply, while there are ostensibly never enough resources available, the fact remains that if an issue is considered ‘worth’ the resources, ‘good’ leaders will bring attention to the significance of the issue and re-allocate resources. For resources to be secured, as the following sub-section explains, a proactive approach in which stakeholders and citizens are brought into a “realistic and constructive dialogue on a crucial matter” is essential to (re)allocating resources (Barron et al., 2012, p. 2200).

4.2.4.3 Communication and information

Communication and information arguably cannot be done without, making this cross-cutting issue a crucial element at all stages of the adaptation process. Communication covers all aspects of information generation: which information, by whom, for whom, how it is conveyed and by whom, as well as who the recipient is and how the information is understood. Put simply, communication requires information (Moser & Ekstrom, 2010).

Publications such as by Kahan (2010), Moser and Dilling (2011), and Pidgeon (2012) underline the prominence accompanied by the challenges of communication. Kahan

(2010) argues that cultural values influence what and whom we believe. Essentially people make decisions that continue to connect them with their peers. After all, it is with likeminded people that humans share important connections. This leads to a polarisation in value systems. Kahan (2010, p. 296, inverted commas in original) discloses that “[t]he same groups who disagree on ‘cultural issues’ — abortion, same-sex marriage and school prayer — also disagree on whether climate change is real.” A 2012 *HorizonPoll* shows that the number of New Zealanders who think that climate change is an urgent and immediate problem has slumped by 22% compared with a poll undertaken four years earlier in which three out of four New Zealanders held that view. The latest poll shows that only slightly half of 2829 respondents aged 18+ consider climate change to be either an urgent problem (21.4%) or a problem for now (31%). In other words, in New Zealand the number of people considering climate change an urgent or immediate problem has dropped from 75.4% in 2008 to 52.4% in 2012 (HorizonPoll, 2012). As I have discussed earlier, this in itself represents a barrier. Having “no politics of climate change” (Giddens, 2009, p. 4) plays a decisive role in explaining this phenomenon. Further, issues of accelerating globalisation, technological change, and time-space-distanciation representing the organisation of time and space and connecting presence and absence have their role to play (Giddens, 1990).

However, communicators can turn this premise into an advantage, despite an inherent complication in the climate change message resulting from a cluster of features (Morton, Rabinovich, Marshall, & Bretschneider, 2011). This can be achieved by communicating in a way that does justice to the local context and is agreeable with local culture (i.e. Māori/Pakeha, permanent resident/absentee, short-term/long-term). Furthermore, communication must go beyond the essentially inherent uncertainty of climate change information and long-term and large-scale social change processes and implications and include the short-term horizon inherent in both economic and political decision-making (Brulle, 2010). Moser (2009a) found that the way information is processed, as well as a complete lack or infrequency of communication negatively impacts social interactions among

those involved in the adaptation process and consequently results in adaptation barriers.

4.2.4.4 Values and beliefs

Values and beliefs give direction to choices and decisions made during the adaptation process. Hulme, et al. (2007, p. 3) identify that barriers exist “because of the way a society is organised or because of the values it propagates”. The same, however, is true for drivers of adaptation. Essentially this is in line with the above assertion by Kahan (2010) regarding the cultural values shaping our beliefs. Blennow and Persson (2009) further confirm that strength of belief in climate change and adaptive capacity influence adaptation to a considerable degree. Values and beliefs have implications for understanding, how climate change information is processed, scepticism, the perception of climate change as a distant threat, a missing sense of urgency, fatalism, reluctance to change lifestyles, and externalising responsibility and blame (Lorenzoni et al., 2007, p. 449), or, indeed, the opposite.

Bazerman (2006, p. 188) sees positive illusions in the shape of unrealistic optimism and false sense of control, egocentrism, omission bias, the status quo and overtly discounting the future as barriers influenced by values and beliefs when it comes to the motivation to address climate change and consequently adapt. In principle, values and beliefs fundamentally influence how we address new livelihood strategies. Ultimately, the way livelihood strategies are addressed results in either adaptation barriers or drivers. Such choices and activities have a bearing on sustainability and the reduction of vulnerability. For now, however, climate change in New Zealand ranks low in the list of major issues (Greenhouse Policy Coalition, 2010) and “[t]he elephant in the room sits undisturbed while collective acquiescence and cognitive dissonance trample all who dare to ask difficult questions” (K. Anderson & Bows, 2012, p. 639).

Nonetheless, based on environmental psychological findings, Moser and Ekstrom (2010, p. 22030) highlight that “cognitive filters shape our perceptions, constrain our attitudes about options (and others involved in the process) and influence our decision-making processes” (see also Moser, Kaspersen, Yohe, & Agyeman, 2008; Renn, 2008). Again, this can work both ways and there is a crucial point as to why culture, values and beliefs are imperative to address, despite being highly complex. Human actions can be irrational and non-linear and therefore, if there is an acknowledgement of (cognitive) filters, the direct perception before filtering out must be acknowledged too. People can experience unprecedented changes in their environment first hand which in turn shapes subjective lived experiences resulting in differences in political engagement. Consequently, Tompkins, et al. (2010) argue that belief in real or perceived climate change represents the strongest motivation for adaptation and therefore driver in overcoming barriers, which is the subject of the following section.

4.3 Overcoming barriers

The third and final step in Moser and Ekstrom’s (2010) framework to diagnose barriers to adaptation comes as a simple matrix making possible the location of possible points of intervention to overcome a certain barrier (Figure 4.2). The authors find that overcoming barriers is not necessarily a prerequisite, but it may be that actors involved in the adaptation process are interested in overcoming them. All in all, as Romero-Lankao (2012) highlights, many key drivers and determinants are involved in the adaptation process which is why Moser and Ekstrom (2010) argue that working through barriers rather than skipping phases may prove advantageous. With regard to the matrix developed by Moser and Ekstrom (2010, p. 22030), the point of departure is as follows:

The spatial/jurisdictional and temporal origins of the barrier relative to the location of the actor are important. The temporal dimension

includes contemporary versus legacy barriers, and along the spatial/jurisdictional dimensions (which sometimes coincide, other times differ in scale), proximate versus remote barriers. Each barrier varies along both dimensions, and, although there may be overlap between legacy/remote barriers and contemporary/proximate barriers, respectively, they are not necessarily identical.

An example-scenario relevant to the Coromandel case study could be as follows: A council planner may be interested in coastal community climate change vulnerability and the rich diversity and contestability of interests to plan for adaptation on the Coromandel. However, such research has not taken place to date due to a lack of incentive and/or funding. This represents a legacy barrier resulting from past science/policy decisions by remote actors (D in Figure 3.3). The council planner is not really in a position to overcome this barrier by addressing it at its source.

		Temporal	
		Contemporary	Legacy
Spatial / Jurisdictional	Proximate	A	C
	Remote	B	D

Figure 4.2: Opportunities for influence and intervention to overcome barriers (Moser & Ekstrom, 2010).

By contrast, Moser and Ekstrom (2010) highlight, a barrier which is both proximate and contemporary is one over which the actor has direct control here and now. For example, a planner realises that not all relevant participants are included so ensures that those left out are invited to the next meeting (A in Figure 3.3). A proximate

legacy barrier (C in Figure 3.3) is when the planner, by way of example, finds a local law (i.e. with regard to coastal armouring) in the way of pursued adaptation action. An initiation of local regulation changes may result in the overcoming of this barrier. A remote contemporary barrier (B in Figure 3.3) may result from an agency withdrawing funding for an adaptation initiative due to, for example, unforeseeable budget constraints.

In New Zealand, adaptation attempts have been made, which implies that at least some of the barriers introduced here, must have been addressed and overcome. These initiatives will have required “strategic thinking, resourcefulness, creativity, collaboration, and effective communication” (Moser & Ekstrom, 2010, p. 22030). Examples include a raising of State Highway 18 by an additional 0.3m to allow for predicted sea level rise (MFE, 2008f), storm water upgrades in preparation for more intense rainfall by the Tauranga City Council (MFE, 2008e), and partnership dune restoration programmes in the Bay of Plenty (Dahm, Jenks, & Bergin, 2005; MFE, 2008b).

4.4 An adaptive social-ecological governance approach

In the preceding chapter, I have reviewed political ecology and planning literature in order to build a logical case for a coupling of the two bodies of scholarship. I have built a case demonstrating that both political ecology and planning have shortcomings when it comes to a translation from adaptation theory to practice. The key shortcomings are that political ecology lacks a practical and constructive component to address the local issue of adaptation, while planning struggles with coming to terms with the soft infrastructure: human behaviour shaped by interpretations, perceptions, value systems, ethics, culture, and politics and what fundamentally represents the “conjuncture of culture, society and nature” (Oliver-Smith, 2004, p. 11). Accordingly, planning does not cover an ethnographic angle, which, as I have also argued, is vital in order to do justice to the approach chosen

here. On the other hand, planning has the potential to translate this critique into practice, yet falls short of doing so resulting from a disciplinary paralysis of implementing climate change knowledge into practice.

By connecting political ecology with the planning discipline and building on the framework to diagnose barriers to adaptation by Moser and Ekstrom (2010), I provide an interdisciplinary adaptive framework for the analysis of local insights that combines these elements and, by association, the drivers. Most importantly, my approach places adaptation barriers (the diagnosis as well as location of barriers is made possible through the framework by Moser and Ekstrom) at the centre. Consequently, this approach practically incorporates adaptation barriers and ultimately represents a tool in aid of an overcoming of the 'business as usual' approach by absorbing the core issues surrounding sustainability and climate change within political ecology and planning scholarship (Figure 4.3). In principle, as the preceding chapter has demonstrated, political ecology and planning are pivotally influenced by the same three key factors rooted in the political/economic, the social/cultural, and the ecological system. Both bodies of scholarship concern themselves with issues of sustainability, to which, as I have explained, the dilemma of climate change is pivotal.

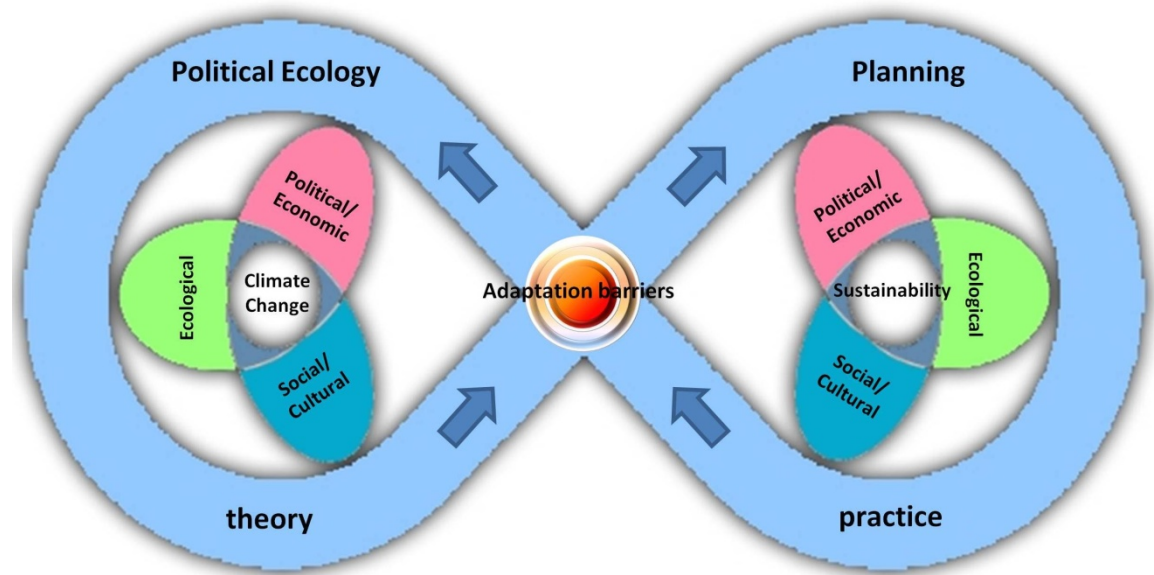


Figure 4.3: Addressing adaptation barriers through political ecology and planning.

What I have also argued is that both disciplines bring their own set of qualities to the table. I have established that political ecology's contribution lies in an understanding of human-in-nature systems while planning's strength lies in shaping sustainable outcomes and their relevance to the local level where large-scale processes become manifest. Based on this understanding, both points of entry are central to climate change in general and overcoming adaptation barriers in particular. Given that adaptation barriers are located at the centre of the framework, the arrows go both ways: cognisance from the two scholarly arenas informs understanding and the development of practical approaches as much as adaptation barriers in themselves must influence and shape both political ecology and planning.

In order for the governance system and the actors to move beyond 'business as usual', adapt, and address the root causes of unsustainable decision-making, the system of concern may no longer be regarded as external. Conventionally, and within an engineering paradigm, actors, the governance system and the system of concern are understood and treated separately and what is missing are all-encompassing adaptation approaches. The result is that the inherent messiness is omitted and there is a tendency to compartmentalise. At the same time, despite

being omnipresent, power in which locals play a part in its operations remains elusive, as demonstrated in the first step in Figure 9.1.

Climate change adaptation requires the “audacity to think differently and conceive of alternative futures” (K. Anderson & Bows, 2012, p. 640). Radically, the very approach and mindset that has resulted in elevated levels of vulnerability failing to recognise the interacting and mutually influencing factors has become misplaced. Within the adaptive social-ecological governance framework, all factors are embedded in the social-ecological context which is also the main driver for adaptation planning. As demonstrated by the cogs in Figure 9.1, planning approaches are best suited to set adaptation into motion when critical thresholds are reached.

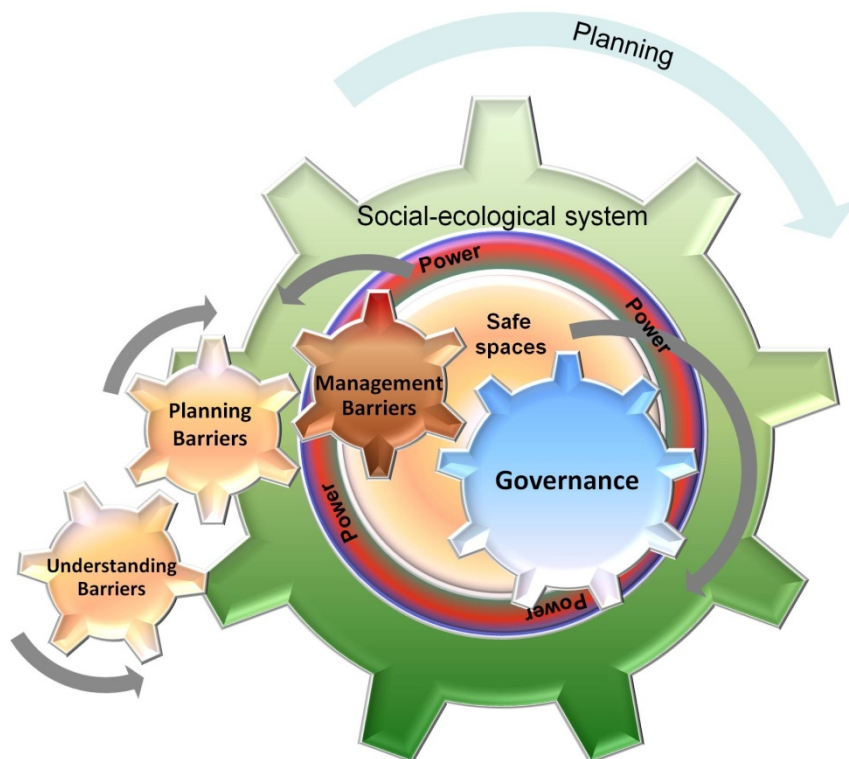


Figure 4.4: Demarcated structural elements must adjust as part of sustainable climate change management.

Indeed, Sustainable adaptation planning practices giving effect to the principle and theory of political ecology are best suited to leverage a transformation. The result is that actors, the governance system and the system of concern are understood and treated as fundamentally interacting and mutually influencing (as demonstrated by the cogs). In turn, the system of concern is understood as the underlying social-ecological context in which processes take place. By explicitly addressing and understanding issues of power, safe spaces can enable an engagement with the challenge of engaging with the political ecology of the planning process. Without safe spaces, such an opportunity would not exist.

Within the safe spaces in which the contested nature of adaptation can and must be fought out, learning and trust can unfold, represented in the third step in Figure 9.1. Within this step, addressing adaptation barriers through institutional opportunities arguably becomes most effective. The subsequent move is then to reconcile contested interests and to break new ground by navigating sustainable adaptation pathways, or otherwise to begin the cycle anew.

The adaptive social-ecological governance framework makes it possible to address this thesis's core question by highlighting key issues persistently standing in the way of constructively addressing climate change adaptation. The connection of theory (political ecology) and practice (planning) and building on Moser and Ekstrom's (2010) framework is promising in a variety of ways, yet must be put to the test if it is to make a contribution to the real world of climate change adaptation. A method which implements the framework as foundation to examine barriers in the according phases and sub-processes using insights from actors represents a promising and refreshing approach and a constructive way forward. In doing so, I put the common barriers in the according phases to the test. Thereupon, common barriers introduced can be confirmed or opposed and the most significant barriers within the local context can be identified and highlighted.

In the following three case study chapters, I take the first practical step. I put this chapter's theory to the test and apply Moser and Ekstrom's framework (2010) against the background of the adaptive social-ecological governance framework. The three geographically and socially distinct communities of Te Puru on the Coromandel Peninsula's west coast, followed by the Te-Whanganui-O-Hei/Mercury Bay and Harataunga/Kennedy Bay communities are the case studies for doing so. These three communities possess not only different physical settings but are very different in their social composition and their history. However, commonalities are many when it comes to climate change vulnerability. Coastal erosion in particular has implications for politics and planning for the following reason: it affects resource access; short-term/long-term approaches and understandings; it is projected to increase with climate change and consequential sea level rise; it results in contestations and is insufficiently understood; and, while it requires adaptation action, any action taken can rapidly prove to be challenged or slowed, if not maladaptive. Furthermore, addressing coastal erosion requires a shift in the conventional adaptation approach of coastal armouring making it less a simple choice (i.e. between hard or soft defence) but an identification of the contested nature of adaptation pathways.

5

Understanding climate change adaptation: A Te Puru perspective

Ma te whakatau ka mohio,
By discussion comes understanding,

Ma te mohio ka marama,
By understanding comes light,

Ma te marama ka matau,
By light comes wisdom,

Ma te matau ka ora.
By wisdom comes life.

—Māori proverb

In this chapter, I apply Moser and Ekstrom's (2010) framework to address climate change adaptation barriers. Through this practical application, I disclose why it makes sense to integrate political ecology and planning. Based on coastal erosion, the approach taken highlights at what point adaptation currently appears to grind to a halt which builds the case for an application of the adaptive social-ecological governance approach. Through a systematic and transparent approach, I disclose that climate change adaptation on the Coromandel Peninsula 'jumps the rails' prematurely when it comes to pressing coastal issues such as erosion. Put simply, adaptation does not proceed far and remains undeveloped. The rich and meaningful insights from those interviewed provide the context as to *why* this is the

case and *why* there is a difference between not only the real world but also the framework introduced by Moser and Ekstrom (ibid.) and the adaptive social-ecological governance framework approach introduced here. Fundamentally, Moser and Ekstrom's (2010) framework is a hypothetical, idealised and rational approach to adaptation which is not how the real world works. On the contrary, as the subsequent insights disclose, local reality is messy and contested.

Ergo, in the three case study chapters of which this is the first, I unify the strengths of Moser and Ekstrom's framework with insights from the adaptive social-ecological governance approach to which political ecology and planning insights are fundamental. On a practical level, the question of how an understanding of the contested nature of adaptation can be deepened is answered. In summary, I unify political ecology's "cultural, social, historical, spatial, and political factors" (Biersack, 2006, p. 28) at the "conjuncture of culture, society and nature" (Oliver-Smith, 2004, p. 11) with planning's practical "place-based problem-solving [approach] aimed at sustainable development" (Davoudi et al., 2010, p. 14) with a "framework to identify barriers that may impede the process of adaptation to climate change" (Moser & Ekstrom, 2010, p. 22026) against the background of adaptation reality.

5.1 Te Puru

When I was just a lad of ten my father said to me
Come here and take a lesson from
The lovely Puru Stream
Don't put your trust in streams my boy
My father said to me
I fear you'll find that streams enjoy a desire to be free

[Chorus]

Puru Stream very pretty and the clear water sweet
But when flooding in the winter she's impossible to beat

Beside that Puru Stream one day
My wife and I did build
A lovely house with gardens all – my ambition had been filled
So many days we did enjoy
Beside this babbling stream
But then one day she rose to be
A raging torrent free

[Chorus]

And now I'm left with battered house
And gardens washed away
She's taken all we ever had we can no longer stay
My house is now a muddy wreck the lawns no longer grow
The stream has swept my life away
My wife and I must go

[Chorus]

The above song, written by Kevin Edwards in 1981, was dedicated to the Te Puru school caretaker at the time and his wife, who lost their property in a storm flood the same year. Contrary to scientific projections of increased risk of “extreme weather events with substantial consequences for societies” (Moser et al., 2012; J. B. Smith, Schneider, et al., 2009, p. 4134; Solomon, 2007; Trenberth, 2011), a new house (completed in 2012) was built in the exact same location on the exterior bank at the Te Puru Stream delta less than 150m from the sea.

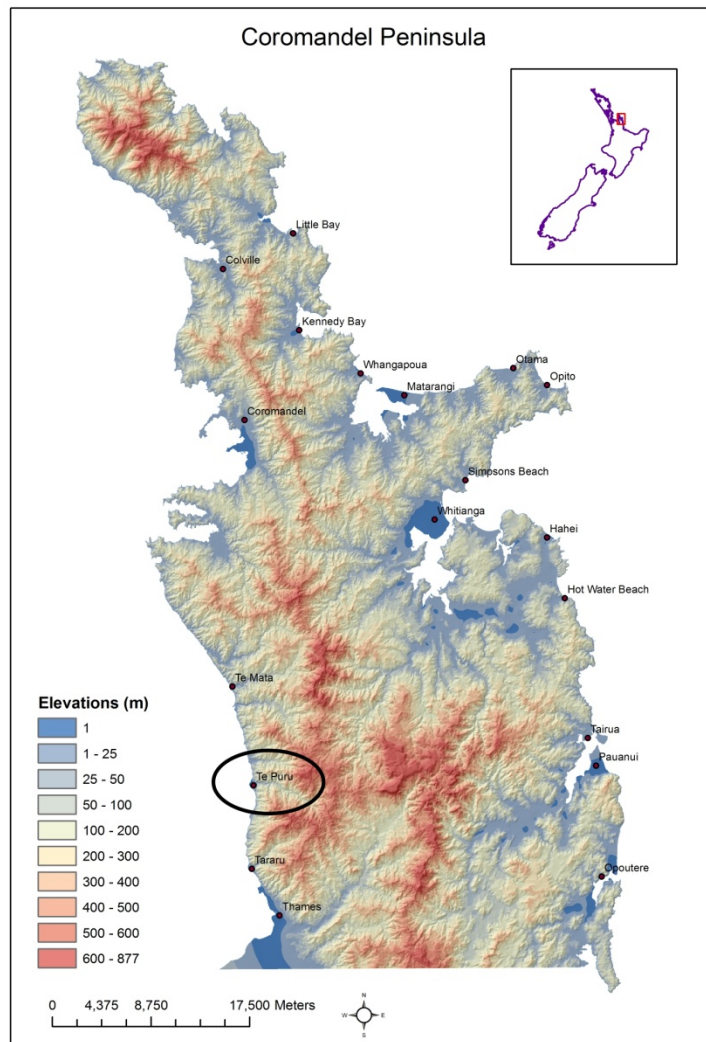


Figure 5.1 Location of the Te Puru community (map produced with data from the Waikato Regional Council).

The community of Te Puru on the western side of the Coromandel Peninsula is home to approximately 942 people of mainly European descent (83.5%) living in 426 occupied dwellings (Statistics New Zealand, 2007a). The community is connected to the north and south by a single road, the Thames Coast Road. Te Puru lies 12km north of the former gold mining town of Thames which has a population of approximately 7136 (GeoNames, 2013) and is often referred to as the gateway to the Coromandel.

Te Puru was selected as one of the three key communities for this case study research because of its high level of exposure contributing to its overall vulnerability to natural hazards, and therefore climate change. The community of Te Puru is built on a fluvial delta which has formed as a result of high sediment yields deposited by the streams within the short and steep catchments part of the Coromandel Ranges. As much as the community owes its existence to the stream, the stream has also always been its biggest threat. The regional and local councils have established the level of individual risk in considerable parts of the community to be “above desirable level” (EW & TCDC, 2003, p. 2). This has resulted in Te Puru holding the highest Annualised Lives Risk⁶² (ibid.) of all communities on the western side of the Coromandel. For this reason, a new bridge designed to withstand a 1/100 year flood event was built in 2010. However, locals have already begun to question this new bridge and are beginning to have doubts. The local coastal campground owner (2012, pers. comm.), for example, questions this new piece of local infrastructure:

We design for the 100 year event but I ask why not for the 500 year event? Why the 100 year event? The 100 year event in ten years time is possibly going to be twofold if we continue to go down the path we’re going. So why? We push a lot of money and resources into that and the limitation of things.

For now, floods represent Te Puru’s biggest threat and also represent the biggest overall impact for the whole of New Zealand (MFE, 2001; Wratt, 2009). Nonetheless, the ocean represents a threat of a different kind. Natural fluvial processes have deposited the sediment and gravel while coastal processes would naturally re-work this deposit continuously. Unaware European settlers have interfered with these dynamics by developing this area by locking in time a naturally highly dynamic area through buildings and infrastructure. Without being locked in

⁶² The suggested guidelines for a total calculated Annualised Lives Risk vary between 0.01 and 0.001. Te Puru’s total calculated Lives Risk is 0.015 (EW & TCDC, 2003, p. 2).

time, this area would otherwise be substantially reworked by natural forces (ARC, 2004).

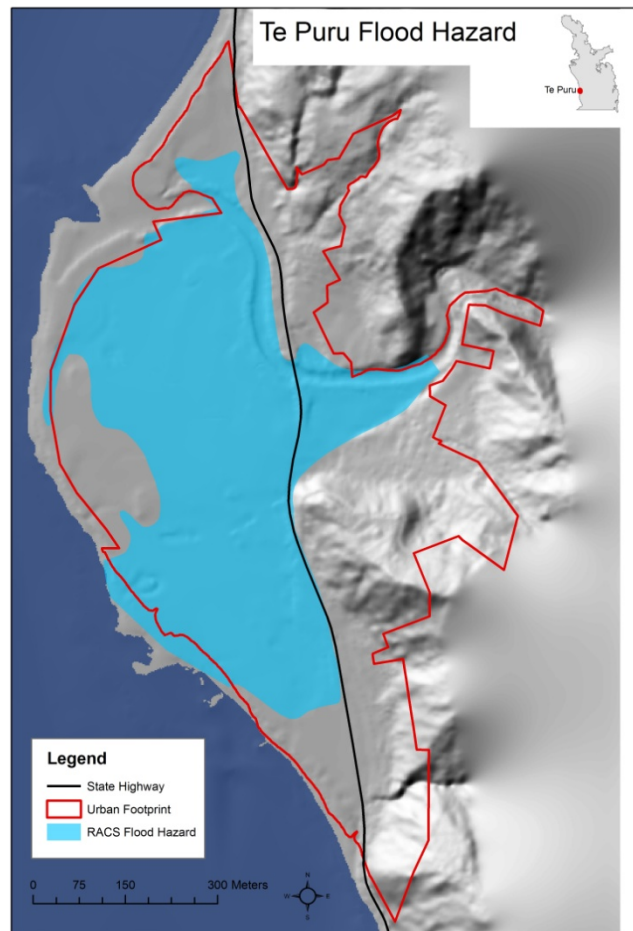


Figure 5.2: LIDaR-based map showing the area at high risk from flooding (data from Waikato Regional Council, 2012).

The point is also that the sea level is rising steadily (IPCC, 2007a; Merrifield, Merrifield, & Mitchum, 2009; Nicholls & Cazenave, 2010; Rahmstorf, 2010). The projected sea level rise of at least 18-59cm by 2090 (IPCC, 2007d) would be alarming enough, but recent research warns of a sea level rise of one metre or more by 2100 (Bamber & Aspinall, 2013). In a summary of regional climate change scenarios, New Zealand's Institute of Water and Atmospheric Research state that the sea level around New Zealand is expected to be similar to global projections (NIWA, 2008a). NIWA furthermore confirms that coastal erosion is exacerbated by a

rise in sea level (ibid.), and the regional council's Hazards and Emergency Management Officer (2012, pers. comm.) pointed the following out:

Te Puru got formed through natural flooding and coastal processes and those processes haven't gone away, they are still there. That's why most of the work that has gone into Te Puru has focused on the river issues. But what do you do when you get sea level rise, where do you go?

It is noteworthy that before European settlement, the Māori Pā⁶³ (Te Aputa) was located on a hill removed from flooding or coastal forces. The flat land Europeans deemed ideal for settlement was reserved by initial Māori settlers for agriculture (Kopecky, 2002).

Independent of climate change, and as one would expect, Te Puru has long battled coastal erosion issues. To date, this issue is predominantly affecting beachfront property owners and the Thames Coast Road. The former Civil Defence Area Manager Ron White, whom I interviewed in 2010 as part of my Master's research into this community, pointed out that at the last perigeon⁶⁴ tide which coincided with calm, fine weather, the sea level was up to the road. Ron, who had been involved with civil Defence on the Coromandel "since the early days", pointed out that when it comes to coastal issues, particularly against the background of climate change, "it makes you realise that you're operating within very fine lines" (Civil Defence Area Manager, pers. comm., 2010).

⁶³ A Pā is a traditional settlement, village, or hill fort (Davidson, 1984).

⁶⁴ A perigeon spring tide is when the moon is closest to the Earth during the spring tide and produces even higher than normal spring tides. Perigeon Spring tides can produce high magnitude flooding along the coastal margins (cf. Duxbury, Duxbury, & Sverdrup, 2002; Easterbrook, 1998).

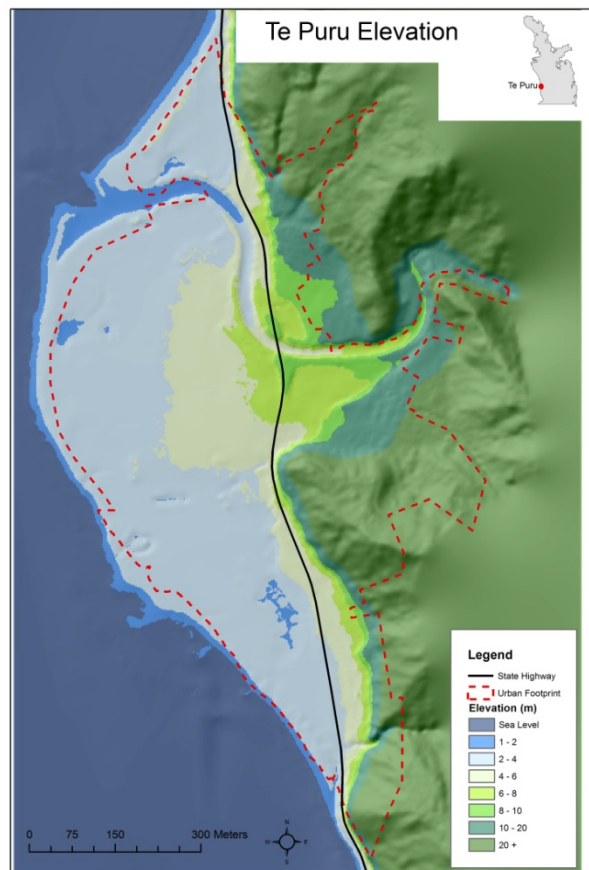


Figure 5.3: LIDaR-based map showing Te Puru’s elevation of merely a few feet above sea level (data provided by Waikato Regional Council).

5.2 Understanding Climate Change Adaptation

In this section, I discuss the adaptation barriers associated with understanding climate change adaptation on the basis of key insights provided by local Te Puru residents and those associated with this community. This approach is in line with the framework developed by Moser and Ekstrom (2010) and discussed by Ekstrom, Moser, and Torn (2011). The Understanding Phase is divided into three stages: (i) problem detection; (ii) gather/use of information; and (iii) the (re)definition of the problem. In total, these three stages are further subdivided into 16 individual

barriers possible to arise within the three stages (Figure 5.5; Figure 5.6; and Figure 5.8).

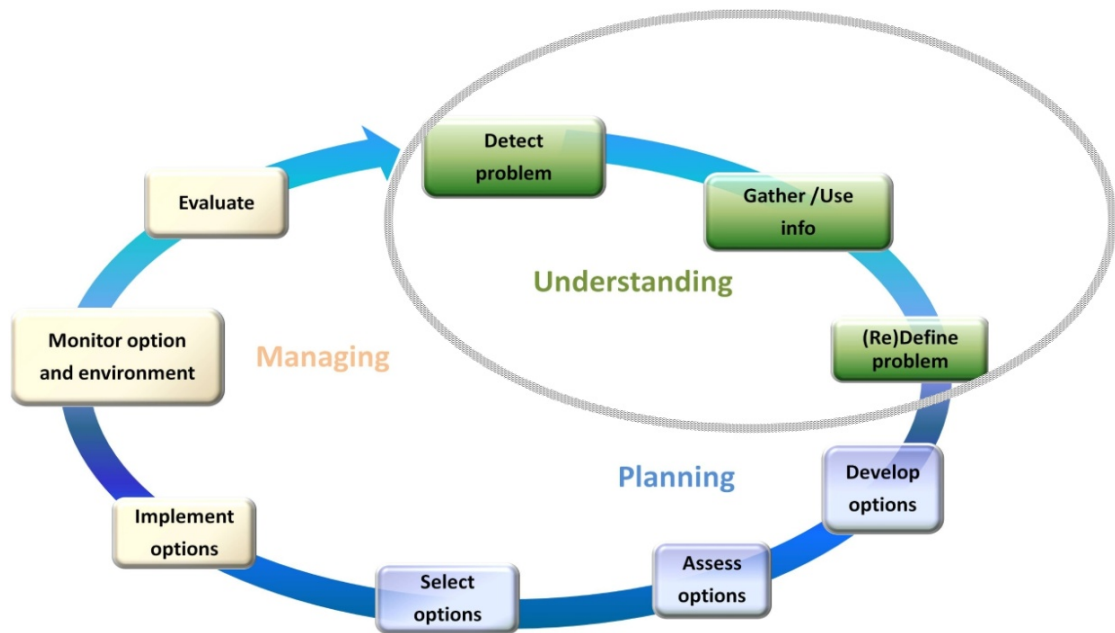


Figure 5.4: The first phase of the adaptation process includes the detection of the problem, the gathering and use of information and the (re)definition of the problem (after Moser & Ekstrom, 2010).

In total, there are four barriers identified by Moser and Ekstrom (2010) likely to arise within the problem detection stage (Figure 5.5). The first barrier is the actual existence of a signal. Ekstrom, Moser, and Torn (2011) point out that the signal can manifest itself in a variety of ways such as a hazard/disaster, the coverage of climate change in reports or scientific findings, a political statement or even a policy change. One such policy change with regard to the coastal zone was made in line with current national guidance (MFE, 2008c) adopting a sea level rise of 0.9m over the next 100 years and has resulted in the local coastal development setback regulations⁶⁵ (cf. Focus, 2012; Ramsay et al., 2012) which will be discussed in more detail in the subsequent sections as well as in Chapter Seven, which discusses the

⁶⁵ Coastal development setback regulations are “planning tools to exclude or restrict beachfront development and land use within areas potentially threatened by coastal hazards or to inform trigger points for the relocation of buildings” (Ramsay, Gibberd, Dahm, & Bell, 2012, p. 8).

Planning and Management Phases in detail. The subsequent approach and logic is applied to all three case study examples.

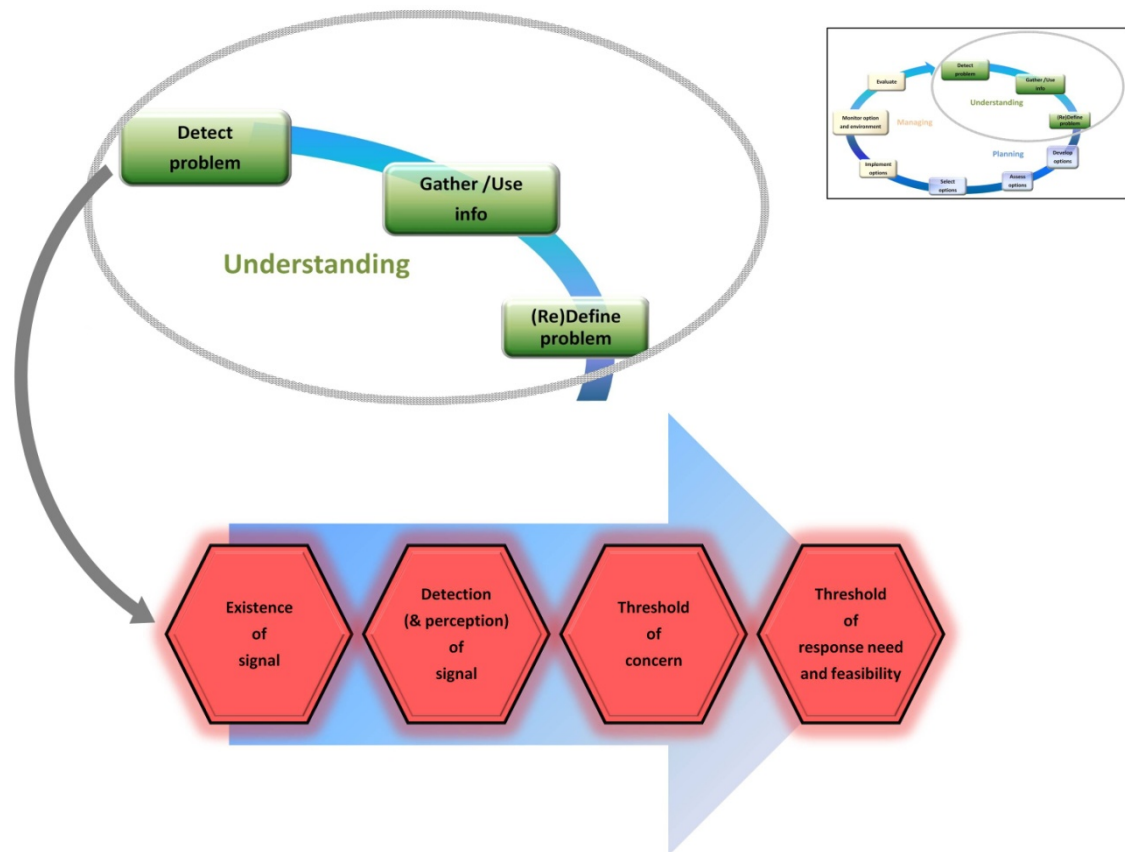


Figure 5.5: Barriers in the problem detection stage.

5.2.1 Barriers in the problem detection stage

The very first question that needs to be answered is whether the local actors detect, receive, perceive or recognise a signal. When I asked a local beachfront property owner and longtime resident in 2010 which the most vulnerable part of the community is, she replied: “[t]he most vulnerable? That’d be us!”. The interviews have shown that locals are very well aware that there is a problem and that it needs addressing. After all, most residents were in general support of a new bridge and the wider flood protection measures undertaken in 2010, such as

clearing out the flood channel. Another local longtime resident (2012, pers. comm.) pointed out the following:

It's the erosion and flooding that we are seeing a lot more now. [These events] here are increasing. I once had the regional council come down here and tell me after the last big flood "we call this a 1 in 100 year flood". I said you need to change that because I am 35 years old and I would have seen about half a dozen floods like that in my life time.

The majority of interviews have shown that a signal of action to deal with present natural hazards is perceived, independent of climate change. The question remains how this signal is interpreted and the issue framed in the context of a lived experience. Psychologist Dan Kahan and Anthropologist Donald Braman (Kahan & Braman, 2006), who initiated the *Cultural Cognition Project* which researches how cultural values shape public perceptions and beliefs, claim that "cultural commitments are *prior* to factual beliefs on highly charged political issues" (p. 148, emphasis in original). Ultimately, Kahan (2010) highlights, cultural values influence not only *what* but also *whom* we believe.

The general techno-fix mindset translates into what is known as the 'No 8 wire' approach and represents the antagonism of applying a theory. While the Convenor of the Ministerial Group on Climate Change Pete Hodgson wrote over one decade ago that the expectation should not be to deal with anticipated impacts later (MFE, 2001), the dominant public discourse appears not to be too far removed from climate change politics, which Collin Challen (2009) summarises through the title of his book *Too little, Too Late: The Politics of Climate Change*. In a nutshell, adaptation is of overall low priority (Blackett, Smith, et al., 2010) and there remains the aforementioned "adaptation deficit" (Burton, 2009, p. 92). A question a longtime resident (2012) from Te Puru asked me manifests this point: "[w]hy spend time and money on something we don't even know is going to happen?".

A signal can also be rejected if an actor is not able to do anything about it, for example due to a lack in decision-making power or authority. The interviews have shown that, overall, it is accepted that natural hazards, including coastal erosion are a fact of life and require attention. Yet there is a discernible doubt among locals that climate change related impacts will result in consequences beyond what can be fixed. This fixing confirms a point made by New Zealand historian Jock Phillips (1996) who claims that 'kiwis' deal with practically everything and anything and are strong and unemotional. 'Kiwi ingenuity' implies that a problem can be fixed when it occurs. As such, this represents a techno-fix approach, which basically represents an attempt to fix a problem which is only part of a much bigger problem. The number of variables are not only reduced, but also altered in the process so as to make the fix appear to be a silver bullet solution (cf. Gardiner, 2010).

Given the strength of the signal in the case of erosion (and also flooding), there is little reason to doubt that the threshold of concern has been overcome in Te Puru. While the actual understanding of climate change among locals appears rudimentary, the problem of coastal erosion is part of the lived experience. Essentially, this represents a problem where the attempt is made to maintain a status quo and protect existing beachfront properties. A regional council planner interviewed (2012), explained that she expects "some people will fight to protect their properties but it's inevitable that the coast line will move back in most areas". A local property owner (2012, pers. comm.) who owns a beachfront house north of Te Puru and felt compelled to protect his property from the sea with rocks confirms the council planner's evaluation above.

Don't know. Do I care ... mmmh, don't know. All the global warming and sea rising, I don't think it's a major issue really. Although if anybody is affected ... (pauses) ... we are.

The above beachfront property owner's insight leads to the final barrier within the problem detection stage of the framework: the threshold of response need and

feasibility. The question here is whether it is perceived necessary or feasible to respond to the signal. This potential barrier determines whether the adaptation process will progress or not.

Citing North (1990), Ekstrom, et al. (2011) refer to an institutional stickiness⁶⁶, whereby institutions are gridlocked and rigid which explains a failure to overcome the status quo. Political ecology's focus on power and interests when it comes to adapting to climate change, especially the way power is implemented to resolve particular situations can prove decisive in the context of institutional stickiness (cf., K. Brown & Rosendo, 2000; Few, 2001). An insight by a Ministry for the Environment spokesperson interviewed (2012), highlights the significance of power when it comes to the detection of a signal:

While the science is accepted by scientists, it is not necessarily accepted by everyone. Often you have powerful councillors who have doubts about the science and then hold on to uncertainties so they don't have to consider it.... Of course it also costs to accept that changes need to be made. If you have to relocate people it is a costly exercise. And that's what it is all about ... effectively discounting.... This is something our political system is not very well geared up to deal with.

The above insight of powerful councillors using uncertainty and doubt as reason for inaction leads to the misleading assumption that "the status quo is preferable, because uncertainties about the positive and negative aspects of action balance one another" (Peterson et al., 1997, p. 5).

The importance of public meetings and/or social/professional networks can also not be underestimated; however these rely on a strong leader. A poignant question asked by Ekstrom, et al. (2011, p. 21) is "[do] laws, policies and social norms (or the perception of these norms) support or prevent taking a problem seriously and

⁶⁶ Stickiness refers to the "ability or inability of new institutional arrangements to take hold where they are transplanted" (Boettke, Coyne, & Leeson, 2008, p. 332). For a discussion of stickiness as political barrier to institutional change refer to Pierson (2000).

responding to it?” For example, at a local long term community plan (LTCCP) meeting in 2012, council representatives made mention of coastal hazard setback regulations and spoke of sea level rise. However, the general perception was that council representatives were ill-informed and not trained to answer climate change related questions. This became evident when the representatives appeared unable to answer a local’s question of how much sea level rise is to be expected. While one of the representatives gave the answer of “about one metre in 100 years time”, the local queried how it is possible that the said 100 years are not decreasing: “I’m almost certain that I’ve been told that shit is going to hit the fan in 100 years time over ten years ago”, which resulted in laughter and vocal support by the other members of the public. Such a situation acts as an adaptation barrier because the publicly disputed issue of climate change is not conveyed by what could be considered the right leader (i.e. someone with a long-term and sustainable community vision). Furthermore, as the following insight by the Ministry for the Environment spokesperson (2012, pers. comm.) highlights, policies are often not taken seriously and merely seen as plan of action entirely separated from legislation⁶⁷:

Councils have coastal hazard zones and there are very tight rules around what you can and what you can’t do in these areas.... Of course when push comes to shove people are going to want to stay there. People just like being by the coast and there aren’t necessarily lives at risk. [While] there are certainly financial assets at risk, very few people are killed in flooding and coastal hazards.

⁶⁷ “Stated most simply”, Peters and Pierre (2006, pp. 265-266) summarise, “public policy is the sum of government activities, whether pursued directly or through agents, as those activities have influence on the lives of citizens”. My general observation over the past years has been that some locals tend to not take policies too seriously, which I discuss in detail in Chapter Seven, Section One. A local resident I spoke to about a house he built without building consent or permit, for example, told me that “council doesn’t have the man-power to enforce most of their rules and regulations anyway” (2013).

A further insight by the regional council's Hazards and Emergency Management Officer (2012, pers. comm.) confirms the governance barrier when it comes to detecting a signal:

Council is subservient to the policies that we have.... At the moment this whole area is still a little bit grey and decision-makers don't have a clear bottom line of what we accept and what we don't accept, so often you [still] see developments. They may get turned down but then again the developer will go through to the environment court [and the development is often passed].

Arguably, in what could be considered marginally suitable for settlement, signals in Te Puru are produced more or less constantly. Every strong westerly coinciding with high tide, for example, brings the sea up to many beachfront properties and the coast road. Furthermore, regular natural hazards such as the weather bomb⁶⁸ in June 2002 or the Easter flood event in April 2003 reinforce the signal. A system-specific question at this first stage of the Understanding Phase is whether a signal exists and what it means. In essence the answer to this question is "Yes, there is coastal erosion and it requires attention". If this attention is not given, an exacerbation through climate change projected impacts will increase the already experienced negative impact.

The New Zealand Transport representative interviewed (2012) sees no problem in coastal armouring and argues, "*if* climate change is really upon us, it's going to be so gradual and any change in the way we do things is also going to be gradual. Don't panic yet!". The local coastal campground owner (2012, pers. comm.) places adaptation on par with fortune telling: "It's a hard one – it's a crystal ball gaze..., [we] have to accept that science will find solutions for future challenges". The attitude that the majority of those interviewed are either ill-informed, ignorant, or deny climate change and its consequences entirely, is exacerbated by the fact that

⁶⁸ The localised 'weather bomb' resulted in a financial damage of approximately NZ\$ 13 million and the loss of one life as a woman in a caravan was swept out to sea (EW, 2009).

coastal erosion or the constant ‘gnawing’ of the ocean on the coastline in combination with sea level rise represents a creeping environmental problem (Glantz, 1999).

The slow onset of climate change related impacts is further complicated by comparatively high climate variability. Te Puru’s geographic location is dominated by the Coromandel Range with its short and steep catchments and the sea which results in much variability. Dominating westerly weather systems and changes in the phases of the Interdecadal Pacific Oscillation (IPO) affecting long-term fluctuations (cf. Salinger, Renwick, & Mullan, 2001) as well as the El Niño-Southern Oscillation (ENSO) (MFE, 2009a) further contribute to variability. The local coastal scientist (2010, pers. comm.) confirmed that “variability is the real concern”:

Variability is what has caught most of our communities out in the sense that we have built communities or undertaken development without awareness of the degree of variability that occurs. Whether it is shoreline movement, flood-cycles or what have you ... and then we get a phase of significant erosion and a higher incidence of coastal storms and we get caught out quite badly.

The threshold of concern or the initial framing as problem, which is the third and second to last barrier in the first stage of the framework, essentially determines whether climate change adaptation is further developed and incorporated into local reality or not. If, for example, coastal erosion is perceived as a fact of coastal life, and devastating storm events are seen as a natural occurrence that need to be dealt with when they happen, the threshold of response need and feasibility will simply not be overcome. A beachfront property owner (2012, pers. comm.) illustrates this barrier as follows: “[t]o me it’s something we can’t change but I am not unhappy to live with it.... I don’t like to get too concerned about it. We can worry about it once it takes shape”.

The aspect of the cultural production of denial, as described by Norgaard (2012) plays a decisive role when it comes to this barrier. In essence, it is through denial that people normalise a troubling situation which results in climate change related problems to be considered “low priority in relation to other social problems” (ibid., p. 80). Further complicating this situation is that, while coastal erosion is nothing new, there is no experience with sea level rise. Consequently, there is no experience, authority or institutional responsibility when it comes to dealing with this problem (Moser, 2009a).

5.2.2 Barriers in the gather/use of information stage

The gather/use of information phase is divided into a total of eight barriers, beginning with interest and focus (see Figure 5.6). In the case of Te Puru, given the omnipresence of natural hazards and the ocean’s continuous ‘gnawing’ at the delta sediment that the community is built upon, those interviewed have shown a comparatively high overall level of problem detection, albeit not necessarily linked to climate change. I have argued in the introduction to this chapter that the fundamental local acceptance is that the physical community has developed on naturally highly dynamic grounds. However, despite council having adopted coastal development setback regulations in order to address a sea level rise there is nowhere to retreat because of the steepness of the land.

In line with the barriers emerging from the framework, I will continue to address the barriers in succession, presuming that in the real world situation the barriers became manifest in a similar manner⁶⁹.

⁶⁹ As discussed in detail in Chapter Four, it was only after I had completed the field work stage of this research that I found the framework to diagnose barriers to climate change adaptation by Moser and Ekstrom (2010).

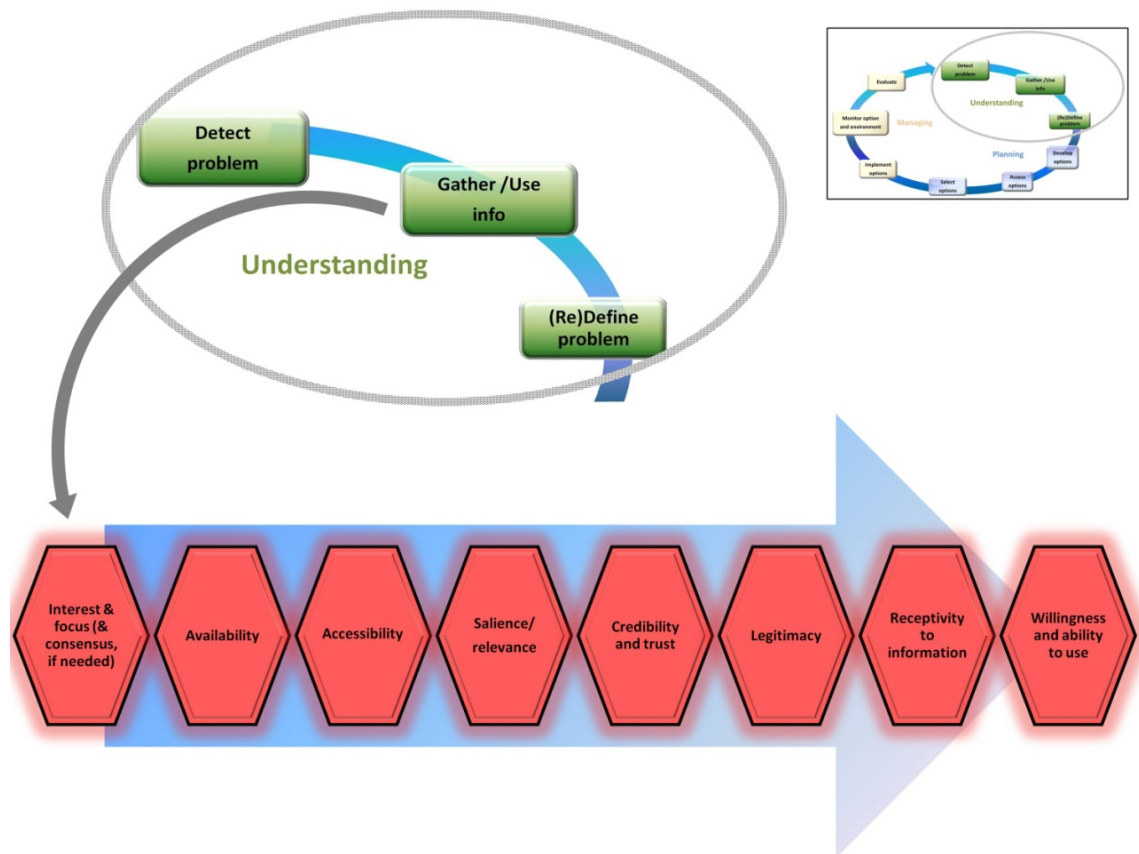


Figure 5.6: Barriers in the gather/use of information stage

The first barrier in this stage (the fifth overall) centres on the actors’ interest and focus and how deeply the problem is investigated. This again, is strongly influenced by some of the core issues within political ecology: culture, values, perceptions, and beliefs (cf. Eiser et al., 2012; Kulatunga, 2010; Nielsen & Reenberg, 2010). The logical consequence is that the actors’ focus is in line with these key points and therefore has implications on the decision made. Two participant insights elucidate this point clearly: Based on an indigenous understanding of the environment and local resources over generations, a regional council Project Manager interviewed (2012) pointed out that “[t]he Māori took notice of their environment and built in sensible places”. Consequently, choices are made based on culture, values, perceptions and beliefs. These choices influence arising problems and how these are defined. Choices have a bearing on the adaptation options taken into account. Choices lead to outcomes and if the wrong choices are made because the problem is not defined appropriately, inadequate adaptation options follow resulting in the

risk of maladaptation. Ergo, if the problem is investigated narrowly, wrong or inadequate choices are made, the adaptation options assessed will remain narrow too. This becomes particularly relevant when there are multiple actors with clashing cultural values like in a Māori/Pakeha situation. Traditionally, for example, Māori view their place in the world different to Europeans. Māori conceptualise humans “as part of a personified, spiritually imbued ‘environment family’... [with] Earth’s bounty considered to be a gift necessitating reciprocity on the part of human users in order to maintain sustainability” (Roberts, Norman, Minhinnick, Wihongi, & Kirkwood, 1995, p. 14). This point is discussed in detail in Chapter Six.

The reconciliation of diverging interests with regard to how the problem is framed is fundamental, otherwise challenges in other parts of the adaptation process will result. Ekstrom, et al. (2011) point out that, on many occasions, gridlocked and long-established, inflexible practices and paradigms make it difficult to identify arising barriers. An *apparatchik*⁷⁰, or government official who follows orders staunchly and without scrutiny, symbolises such an inflexible and outmoded situation. The challenge therefore lies in determining leverage points which are places within the system where small changes result in a large behavioural shift (Meadows, 1999).

Since the problem of coastal erosion has been defined and an interest in information has been established, the existence and accessibility of the required information is crucial. Highly spatially resolved data such as LIDaR (Light Detection and Ranging or Laser Imaging Detection and Ranging, also see Footnote 20) represents an example for information only obtainable relatively recently. Questions such as “where does the data come from, is it relevant to solving the problem, or is it reliable and credible?”, Ekstrom, et al. (2011, p. 24) highlight, are not inherent to the information, “but attributions made of the information by the actor”. Consequently, the actor’s values (Lorenzoni et al., 2007), attitudes, beliefs, experiences, perception of the problem and trust in the information, all part of the

⁷⁰ Originally a Russian colloquialism, the term *apparatchik* is now used internationally to refer to a ‘yes-man’ or someone without grand plans but many carefully executed details (Billington, 2009).

soft infrastructure discussed in the foregoing chapter play a fundamental role. The following example by a local council senior planner (2012, pers. comm.) further illustrates this point:

The essential thing to have is LIDaR information. You can't do any adaptation to climate change work without LIDaR. And you can't ignore the inner harbours and the estuaries. A lot of people are just looking at the beachfront but really you have to look at inner harbours which are all very low lying and big areas. Habitats will also be moving inland as well. They'll be moving onto private land which is a whole other area of policy and regulation.

The above insight demonstrates the range of information required and raises not only the question of the recipient's receptiveness to information but also the level of competency to deploy the information accordingly. What if a decision-maker has no appreciation of habitats, as pointed out above by the local council senior planner interviewed? When these move further inland onto private land representing "a whole other area of policy and regulation" (ibid.), an appreciation of habitats and the according information will be essential. In a study undertaken by Seavey, Gilmer, and McGarigal (2011) on the effects of sea level rise on piping plover habitat, the authors demonstrate that human development stymies any habitat change. Interestingly, the study shows that the intensity of development is not necessarily as decisive as the actual spatial configuration of developed areas. The insight from the local council's senior planner insight demonstrates that there is a risk that required information reaches a level of sophistication and complexity where it becomes inaccessible to some users.

Government departments or certain organisations are naturally defined in their focus and therefore, naturally, lack familiarity with other oftentimes relevant questions or information outside their focus. One such local example is the New Zealand Transport (NZTA) representative in charge of the Coromandel's roads,

including the single road leading in and out of Te Puru (State Highway 25). Following a drop in beach level after a rock wall was put in place, the NZTA representative (2012, pers. comm.) who works out of an office in Hamilton (almost two hours drive from Te Puru) said “I do not know whether that’s a normal event out there. I have the feeling it is. It’s just a natural event. Whether they are getting worse, I wouldn’t know. We don’t monitor it”. This insight indicates that the NZTA representative does not see the need or is otherwise discouraged to seek information beyond his immediate scope.



Figure 5.7: Entering Te Puru from the south (Thames) on a calm day. Coastal ‘rip-rap’ revetment increasingly dominates the Thames Coast (photo by author, 2013).

The absence of clear and indubitable regulations as to the extent of acceptability of infrastructure protection has a bearing on the information sought. The NZTA representative’s lack of information about coastal processes and whether or not conditions “are getting worse” could be alleviated by incorporating local and traditional knowledge. The interviews with locals have shown that incorporating such knowledge is still not common practice.

With regard to the above example, a field note I made in June 2012 illustrates this: as I was taking photos of the rocks NZTA contractors were building up to armour the shoreline at Te Mata beach (approximately 10km north of Te Puru, Figure 1.7), one of the workers approached me. Almost apologetically, the worker said to me “It’s because of the erosion; we have to do it to protect the road”. I asked whether the erosion was increasing and more shoreline armouring is required than in the past. “Oh yes” the worker replied, “definitely increasing, but what do you do?”. Since these rocks were put in place, I have witnessed a complete withdrawal of a high tide beach in this area. Such interference with dynamic coastal processes through armouring, O’Connell (2010, p. 65) highlights, “continues to be responsible for the reduction in the beneficial functions and sometimes complete loss of valuable coastal resources, such as beaches, dunes, and intertidal areas [which] results in the loss or alteration of associated marine habitat”.

A further example was provided by a Te Puru beachfront property owner (2010, pers. comm.) who accused local council of incorporating neither local nor traditional environmental knowledge:

The people in the area are the ones that should be talked to but then again that’s jeopardising some of their [council] decisions.... [T]hey don’t listen, they don’t look at it. A few years ago they [council] dumped slabs of concrete with reinforcing steel sticking out of them on the beach [to protect the land]. They now get washed up and down the beach.... Once we had a battle when they were carting away sand [from the beach]. They were simply taking it away. They disturbed the [natural movement] of the sand. We now have less sand [on the beach] than we had before.

An incorporation of local and/or traditional environmental knowledge/insights will require a transformation of existing decision-making models. The interviews have shown that the decision-makers are convinced that they are making adequate use

of both local and traditional environmental knowledge while the majority of those interviewed do not feel included in decision-making. The local coastal scientist interviewed (2012) confirms this: “The amount of effort that is put into communication and connection with the community (is) appalling”. A local Māori interviewed (2012) argued that “they [council] don’t take into account any of *our* local knowledge”.

Moser (2005) draws attention to information production as part of the adaptation process and to what extent this information represents all relevant interests. For example, the *Climate Change Effects and Impacts Assessment* guidance manual published by New Zealand’s Ministry for the Environment for local government (2008a) states the following when it comes to incorporating local and traditional knowledge into decision-making: “Seeking expert opinion *can* involve the presentation of plausible scenarios of climate change for your region to knowledgeable people in your region” (MFE, 2008a, p. 55, emphasis added). A comparison of eight adaptation guidance publications (Schneider, 2010) showed that the only other guidance publication drawing attention to the potential of local and/or traditional environmental knowledge is the United Nations Environment Programme (1998). The *Handbook on Methods for Climate Change Impact Assessment and Adaptation Strategies* states that “The judgement of experts, who may include people with a lifetime of experience but little formal education, may be quite accurate, but its use is hard to justify in terms of the scientific methodology since it is difficult to test” (ibid., p. 362).

The way such information is perceived depends not only how it was produced and by whom but also on the willingness to use it, which again falls back to the actor’s value system and culture. A racist actor, for example, is unlikely to seek expert opinion from traditional knowledge carriers. A local key informant argued the following when I asked if relevant information from local Māori should be included in adaptation work:

No, absolutely not. They were cannibals. They had slaves that were their 'meat on the hoof'. They ran their meat alongside them. They talk about having regard for the environment and sewerage is treated et cetera, et cetera, and so they want systems now where it is run over the ground because of cultural sensitivity et cetera ... bullshit! My understanding is that wherever they lived they would just hang around and they shat straight into the river. C'mon, get real! It wasn't a cultural practice, they just dreamed it up to get a bigger slice of the pie... no, I am not into that!

A further example for unwillingness to use information comes from the New Zealand Transport Authority (NZTA) representative (2012). This actor is unlikely to incorporate any climate change information from the IPCC into his decision-making because in his words, "the IPCC is *grossly over-exaggerating*". Despite this actor's decision-making position which should arguably take into account a wide range of information, he strongly believes that "[t]here is a lot of science that says that climate change is not the case. We came out of an ice age. We're going through these normal cycles anyway" (ibid.). This actor not only impeaches the credibility of the scientific consensus as reached by the IPCC but argues that there are other equally credible or, to him, more credible information sources potentially overriding the IPCC consensus. Arguably, the main scientific criticism directed towards the IPCC is that dangers are underestimated, risks understated, and findings focus on the "lowest common denominator" (McKibben, 2007, para. 8), which is the exact opposite to this actor's assertion of "*gross exaggeration*". The NZTA representative further argues that there is "a lot" of science refuting climate change. To date, however, no scientific body disagrees with the tenets of climate change and the role of human-induced greenhouse gas emissions (Anderegg et al., 2010; Brigham-Grette et al., 2006; DiMento & Doughman, 2007).

While, of course, the future is always uncertain, documents such as the Natural Hazards section of the *Coromandel Blueprint* (TCDC, 2010a), the *Thames Coast*

Flood Risk Assessment (EW & TCDC, 2003), or the *Coastal Hazards and Climate Change* (MFE, 2008c), to name but a few provide sound information about Te Puru's vulnerability. Uncertainties in climate change projections are often used as an excuse for inaction (Dessai, Hulme, Lempert, & Pielke Jr, 2009). Yet, a point frequently overlooked in the process, is the fact that uncertainties are a basic principle of the future in general. In other words, an important factor of adaptation is the way the challenge is framed.

In a study researching how framing changes responses to uncertainty in climate change communications, Morton, Rabinovich, Marshall, and Bretschneider (2011) found that uncertainty is not inevitably a barrier to action. A framing that triggers caution in the face of uncertainty, the authors argue, can help overcome this barrier. Interestingly, matters are not as uncertain as they are portrayed and consequently perceived to be. Public perception of scientific uncertainty in climate change projections does not match reality (Anderegg et al., 2010). Using an extensive dataset of 1,372 climate researchers and their publication and citation data, Anderegg, et al. (2010) show that 97–98% of the climate researchers most actively publishing in the field are in support the IPCC report. Put simply, the uncertainty the media and climate change 'deniers' in particular claim to be implicit in climate change science does not exist.

Whether real or not, the perceived uncertainty can play a decisive role in actors' receptivity of and willingness to use information. The local council's senior planner (2012, pers. comm.), for example, argues that "much uncertainty will be removed when the (IPCC's) 5th assessment report gets published". Ekstrom, et al. (2011) write that when desired information about the system cannot be attained, actors choose either to do nothing until greater certainty exists, shift the initial problem framing so that it becomes an issue of uncertainty, focus on the aspect of the problem that is better understood, or develop robust options based on agreed-upon scenarios.

5.2.3 Barriers in the problem (re)definition stage

Addressing the preceding 12 barriers has led to a situation allowing for the initial problem to be (re)defined and reframed. The result is that coastal erosion in Te Puru is, arguably, better understood because the barriers in the initial problem detection stage were overcome and information has since been gathered and used. An analysis of the receptivity to information and the willingness and ability to use the information (the last two barriers in stage two) in particular, have so far revealed most strongly that there is a cacophony of voices resulting in contestations and varying levels of understanding. A (re)definition of the problem is a crucial process in addressing the barriers in place. By addressing the barriers in stage two, an overall understanding of willingness and ability has been established, without which response options will prove futile. The barriers encountered in this third and final stage of the Understanding Phase are similar to the initial problem detection stage. In an ideal world, deliberation has advanced actors' understanding in order to make way for the subsequent Planning Phase. This stage involves the four key barriers shown in Figure 5.8.

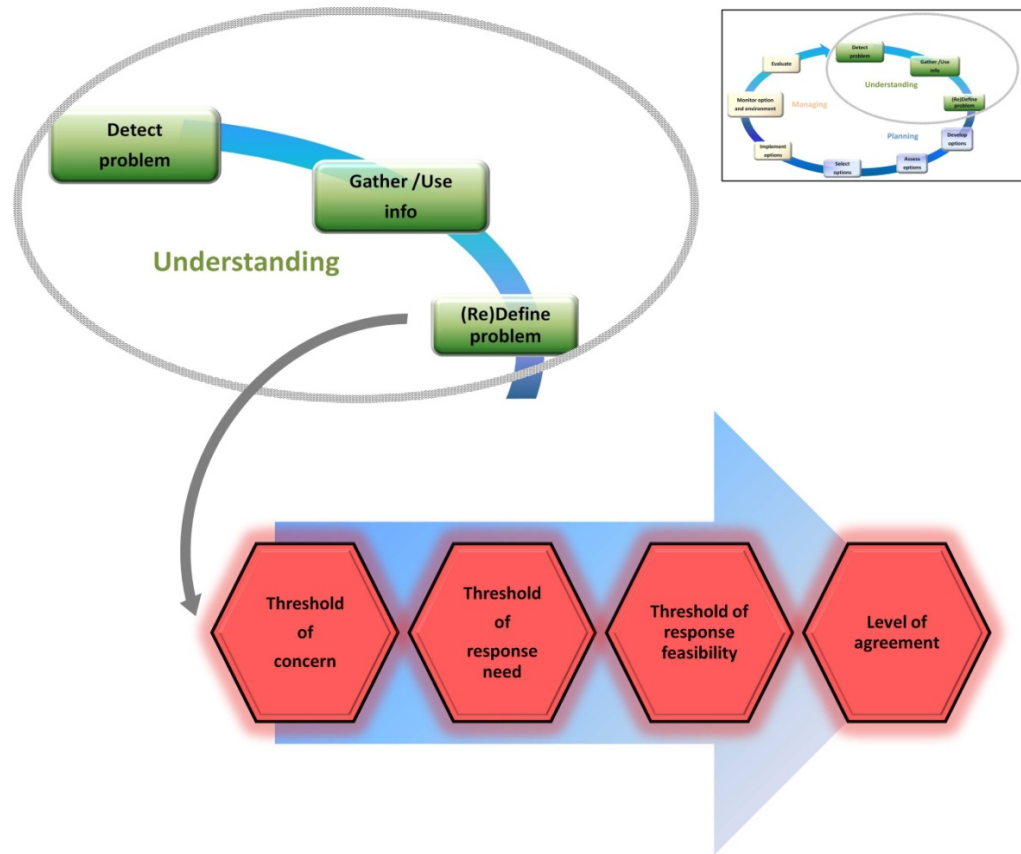


Figure 5.8: Barriers in the problem (re)definition stage.

Similar to the initial problem detection described in the problem detection stage, factors central to political ecology shape the problem (re)definition stage. Ekstrom, et al. (2011, p. 27) write that “cognitive, psychological, social and other factors shape all aspects of this process, including what information is used to redefine the issue and what pre-existing beliefs, values, and norms set the foundation for whether and how the risk is interpreted and the problem gets reframed”.

The attempt by local council to ‘climate proof’ development through setback regulations or building the new bridge so that it can withstand a 1/100 year flood event is one way of framing the problem. Put differently, the focus does not solely lie on climate change adaptation but on addressing hazard issues already problematic. Ergo, actions are risk-focused and do not postulate the same level of climate change acceptance as, say, a purely adaptation focused approach. The term ‘climate proofing’, coined by Michael Glantz (2003), is a practical approach to

assessing and dealing with climate risks (F. Ludwig, Kabat, van Schaik, & van der Valk, 2009). Ekstrom, et al. also (2011, p. 27) make mention of a “fundamental transformation of human-environment interactions”. In terms of ‘climate proofing’, the following excerpt from an interview with the local council senior planner (2012) shows a novel approach to the way the coastal erosion problem is framed locally by means of a backstop wall:

The more forward you put a wall the more robust it has to be to withstand the coastal processes. If you put it back behind – and the problem here of course is that you are putting it into private property – you don’t have to build it so robust or so high and it’s only going to be uncovered after a really severe event. For the rest of the time you can restore the beach and the sand dunes and what have you. So apart from having a buried wall, most of the time, you’ve got a natural system. That’s good for your amenity; it’s good for your actual enjoyment of the beach because it’s good to go over sand dunes to get to the beach rather than finding your way through rocks dragging your dinghy over rocks and you also stand a greater chance at selling your property at a higher margin.

But the problem is that people are people. I don’t think it’s going to fly at all. It might happen if there is a really severe storm and people realise that they’ve got to plan, they’ll say “let’s go to council with it”. With the change of the District Plan we’ll now allow these sorts of structures on private land where people act collectively we are going to treat it as a much lesser application than if it was a front-stop wall being built on public land. So instead of a non-compliant activity application, it will probably be non-notified too. So we’re even changing the consenting process to facilitate the ability of people who want to collectively take this responsibility for the hazards to get these sorts of consents. So instead of spending tens of thousands on consent for a wall, people

have the option of going for a non-notified application which can probably be done for less than \$10,000. You've still got to do the papers and what have you but the engineering criteria for a back-stop wall are a lot less than a front-stop wall. You've got a much simpler structure because you are further back and not so much in the dynamic zone.... We've been trying to work with beachfront property owners to try and implement a long-term solution, if you want to call 50 years long-term. That starts to give you enough breathing space because I think that within the next 50 years the impact of climate change will manifest itself in a manner that cannot be ignored.

The above insight "the problem is that people are people" is decisive. The local council's senior planner highlights that the way the information about the problem is interpreted, determines whether adaptation action is warranted or not. Cognitive factors determine whether and how the problem is (re)defined. However, these cognitive factors are subject to the aforementioned local knowledge-practice beliefs and cannot be seen in isolation. Indeed, "general and specialised knowledge", Perkins and Salomon (1989, p. 16) point out, "function in close partnership".

Ekstrom, et al. (2011) make clear that a shared definition of the problem is indispensable for progressing the adaptation process from here on. In quoting Daft (2008), Ekstrom, et al. (2011), write that in the absence of an agreement, the process must focus on achieving an agreement on goals and priorities. The interviews demonstrate that a local agreement on the problem (re)definition has not been reached and that the issue remains highly contested and oftentimes misunderstood and/or misinterpreted. This is the case despite Te Puru being "very vulnerable" (local coastal scientist, 2010, pers. comm.) and retreat not an option due to the terrain. In essence, a polarisation of opinions resulting from different value systems and interests has occurred. Some of those interviewed have no doubt that there is a problem requiring action, while others are convinced that "it's all a whole lot of bullshit" (longtime resident, 2012, pers. comm.).

The question remains whether the problem is being dismissed or taken seriously by leaders, social norms, or institutions (Moser, 2009a). Ekstrom, et al. (2011) point out that the appointment of a clear leader can make a decisive difference to the way climate change adaptation is dealt with. As it stands, however, local council is awaiting leadership from the regional council, which in turn is not prepared to take leadership in the absence of backing by government at the national level. For local government it therefore becomes very difficult to “consider a long-term decision because it is going to upset the community, whereas if the [central] government can be the baddie it’s a lot easier for them to make a decision like that” (regional council Coastal Manager, 2010).

Furthermore, appointing a leader who has the potential to make a difference is complicated by a general public drop in confidence that climate change is a serious issue (HorizonPoll, 2012). The former Coromandel District Mayor Philippa Barriball, whom I interviewed in 2010, was an adaptation leader who was chairing the local government climate change committee. Mayor Barriball (2010, pers. comm.) advocated strongly for climate change adaptation and made sure to convey the message so that it was understood by locals, as the following excerpt demonstrates:

When educating the public about the anticipated climate change impacts, I don’t try to sell climate change to people. I’m trying to sell what is important to people and how this might be at risk. I tap into the emotive side of people and ask questions like “Which is your favourite beach? How would it affect you if we were to build a rock wall around it”?

The current Mayor Glenn Leach, on the other hand, has “not seen anything that tells [him] that it’s happening or the sea level is rising” and consequently also sees no need for action. Mayor Leach’s assessment represents a direct cognition problem with obvious implications for the community. Mayor Leach justifies his lack of leadership when it comes to adaptation with the position that he is awaiting

leadership from the national level. When I asked the Mayor about the significance of climate change for the Coromandel and communities like Te Puru in particular, he replied the following:

Ah, look; I'd hate to think that we've downplayed it. From the position that I am in, I listen to it and I listen to the sciences from MFE and the bits and pieces. I look at it and say, if there is a problem, we can only take leadership from what comes out of central government (Mayor Leach, 2012).

While sufficient needed information is available for councils to take timely steps and adapt to projected climate change, the actual process is severely hindered by an absence of clear direction from central government. As it stands, however, political motivation for action at a central government level remains absent. In line with international efforts to expand fossil fuel extraction, New Zealand is aiming to "responsibly develop petroleum resources to grow the economy" (NZPA, 2011) in "an important step towards realising the potential of New Zealand's oil and gas resources" (Energy and Resources Minister Phil Heatley in A. Bennett, 2012). Appointing leaders with a vision for adaptation appears to be "impeded by the financial power of special interests" (Hansen et al., 2012, p. 17). The regional council Coastal Manager confirmed this situation as follows:

[Climate change] planning and guidance documents [state that] if [infrastructure] is going to be within the zone of sea level rise over the next hundred years it's got to be transportable and all that... that's rubbish. You just shouldn't be there at all. Because a hundred years will be over, the house will be under threat, a problem has been created that everyone knew existed and the response will damage and impact on the emotions of the home-owner, society and the economy. Why create a problem in the first place? Government *must* be a lot stronger

around being directive at what the local councils and regional councils have to do.

In summary, the interviews have shown that the governance system re-defines the problem in a way that leaves little doubt about the necessity for adaptation action. This re-definition is not necessarily based on climate change per se. Coastal erosion stands out as a far less politically emotive key problem. However, Ekstrom, et al. (2011, p. 28) highlight that “[e]ither too broad or too narrow a problem definition can create impediments that surface in later stages and stall or divert the process or drive it down a potentially maladaptative pathway”. Reflecting on the NZTA representative, who does not see a problem in coastal erosion or the local participant who spoke of council removing sand off the beach, the risk of maladaptation is pervasive. The problem is that shoreline armouring to achieve a stabilisation of a naturally dynamic area “will cause the narrowing and eventual loss of the adjoining beach” (Fletcher et al., 1997, p. 209). Hence, coastal erosion is a fundamental aspect of climate change with implications for both politics and planning. Coastal erosion has implications on resource access, needs to consider short and long-term approaches, is obvious, results in local contestations (as the previous stages have shown), is projected to increase with climate change and, if defined wrongly, will result in maladaptation. As such, coastal erosion requires sound planning and problem management.



Figure 5.9: The Thames Coast Road and the Te Puru School (looking south) after the weather bomb in 2002 (photo by Civil Defence, Thames).

However, the insights from key participants presented thus far as well as the unregulated ad-hoc approach to coastal erosion⁷¹ demonstrate that even if the right amount of resources were allocated and the political will to tackle the problem were given, there would still be no techno-fix to overcome the dilemma. Particularly in Te Puru there is no place to retreat and the question remains how to sustainably protect a community to which the anecdote of Damocles' sword could not be more apt: Fortunate it may well be, yet fear (or risk) always looms. The question therefore becomes how can sound planning alleviate this dilemma and assist this community in addressing barriers? Is this even possible, given the physical prerequisite and the fact that there is no shared understanding let alone knowledge

⁷¹ Chapter Five discusses the ways coastal erosion is dealt with in further detail and provides recent examples of both individuals as well as Local Council armouring the coast as they see fit. To date, there is no overall plan for the Coromandel identifying areas where shoreline armouring is necessary or acceptable. While Policy 27 of New Zealand's Coastal Policy Statement (NZCPS, 2010) discourages the use of hard protection measures, it concedes that these may be necessary. Policy 27 makes clear that alternatives to hard protection should be considered where possible and appropriate.

of the problem? These and other questions will be addressed in Chapter Eight which explicitly focuses on the adaptation Planning and Management Phase.

5.3 Barriers too substantial to be overcome

A hypothetical smooth, barrier free Understanding Phase, while no guarantee for adaptation success (cf. Moser & Ekstrom, 2010), would logically proceed to the Planning Phase. Partly, the adaptation process in Te Puru already stumbles in the Understanding Phase, particularly when it comes to actor willingness and level of agreement. Leiserowitz's (2006b) appraisal of climate change ranking low in the list of important issues helps to understand why this is so. The situation is further complicated by a lack of leadership and clear direction from above, which both regional as well as local council continue to be waiting for. The fact that the community of Te Puru is built not only in a highly dynamic geographical area with a high degree of climate variability, as well as on unstable ground with no place to retreat given the steepness of the terrain, further complicates the issue substantially.

Given that the challenges arising from climate change are unprecedented, it remains unclear whether an exposed community such as Te Puru might not even be in a more suitable position to adapt. However, a fair question to ask is what physical options the Te Puru community really has, given its comparatively high level of vulnerability due to its physical location. Techno-fixes are not sustainable options and any solution to the dilemma is not a simple matter of doing one thing or the other. Ultimately, the basket of options will have to be a combination of approaches sustainably transforming the social status quo.

However, as it stands, this status quo is stalled in "organizational culture, missions, policy histories and priorities, and institutional stickiness" (Ekstrom et al., 2011, p. 32). Furthermore, as I will describe and explain in detail in Chapter Eight, there are

five significant barriers of repeated and cross-cutting importance throughout the adaptation process identified by Moser and Ekstrom (2010). Leadership, communication and information, values and beliefs, resources, and participation must be given close attention (and barriers overcome) in any attempt to adapt to climate change through social transformation. By the same token, the “political forces, conditions and ramifications of environmental change” (Bryant, 1992, p. 13) must be taken into account in any wholehearted attempt to adapt sustainably.

As I have also demonstrated in this chapter, it is essential to listen and pay attention to the stories of the real world, the real community. There is no one-size-fits-all approach to climate change adaptation and if the problem is to be detected and redefined sustainably, it is indispensable that it gets understood adequately in a locally relevant social-ecological context. After all, “the risk imposed by hazards is the result of [a] nature/human interaction, and the effect of these dynamic and variable processes on the rather less dynamic and more static resources of the coast” (Auckland Regional Council, 2000, cited in Ramsay et al., 2012, p. 3).

In the following Figure 5.10, I visually represent the richness of the interview data from Te Puru with regard to understanding. The percentaged representation of word frequency from participant interviews visualises the heart of what participants spoke about in the context of understanding climate change. The word cloud makes possible a quick overview of the common themes by disclosing some general patterns (McNaught & Lam, 2010, p. 641) . By providing a broad indication of the terms used most frequently, Figure 5.10 illustrates the main issues of concern for the Understanding Phase of the adaptation process. As such, this visual representation of the richness of participant insights reveals the differences between the understandings from the three communities making up this case study research⁷².

⁷² See Methodology (Chapter Two, Section 2.5.3) for details on how the word clouds were generated and the potential for this visual representation as well as the motivation for using this form of coding interview data.



Figure 5.10: Visual representation of interview data from Te Puru for the Understanding Phase.

The majority of key words used by local participants and catching the reader’s eye in Figure 5.10 are in relation to government activity and responsibility with regard to adaptation. These include “council”; “district plan”; “central government”, “RMA” (Resource Management Act); “change and problem”. These themes are followed by the words “council reports”, “beachfront property” and “private land”. These are followed by the terms “ozone hole” and “two metre sea level rise” which were both referred to twice and are linked to a general misunderstanding of climate change and the consequences. This is followed by one of the main sources of information, the “local paper” and “Peninsula Press”. The key impression from the word cloud is that the paramount climate change adaptation responsibility lies with government. The following simple statistical representation of key words used further underlines the visual representation from the word cloud and confirms both “council” and “RMA” as the most frequently used key words with 17% each, followed by “District Plan” at 14% and “central government” at 11%.

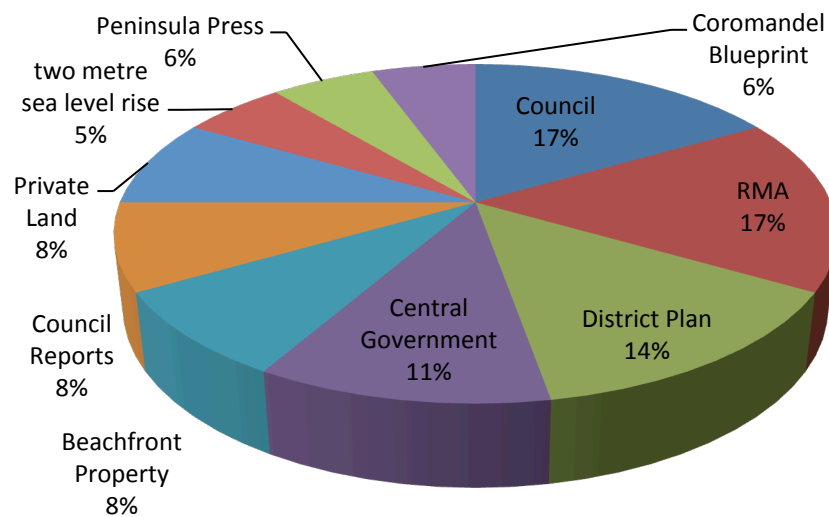


Figure 5.11: Simple statistical representation of word-use frequency from Te Puru.

The frequency of these words used is striking in the way that they confirm that local government responsibilities and actions, in particular with regard to leadership and what is reflected in the District Plan, are fundamental to the Understanding Phase and a broader understanding of the challenge. Moreover, the direction provided by Central Government, a term referred to at 11% gives direction. The use of “private land”, “beachfront” property” alongside the government-related key terms as well as the term “council reports”, all at 8% indicates contentions with regard to ownership (public versus private), responsibility (local government) but also leadership. Leadership represents a key barrier of “repeated and cross-cutting importance” (Moser & Ekstrom, 2010, p. 22029) throughout the adaptation process which I will discuss in detail in Chapter Eight. Seeing these key terms so closely associated with government-related themes, confirms both the potential and relevance of the underlying framework by Moser and Ekstrom (2010) but also a direct link with political ecology, given that leadership is first and foremost reflected in “less obvious expressions of power” (Forsyth, 2008, p. 761). Importantly, however, this chapter used Moser and Ekstrom’s (2010, p. 22031) concluding recommendation, according to which “[p]atterns may emerge from such comparative investigations showing where the biggest barriers lie” as starting point.

In the following chapter, I apply the Understanding Phase of the adaptation framework to diagnose barriers to climate change adaptation to Te-Whanganui-o-Hei/Mercury Bay on the Coromandel's east coast. Much more so than Te Puru, this community is dominated by holiday makers and absentee owners who have invested in coastal property – not because there is nowhere else to go, as is the case in Te Puru – but for lifestyle reasons. This part of the Peninsula faces similar underlying issues but, as I will highlight, these issues are even hotter⁷³ and more contested as a result of the desire to own a slice of coastal paradise.

⁷³ Global warming, the associated rise in temperatures as well as media headlines literally make climate change into a 'hot issue'.

6

Understanding climate change adaptation: a Te-Whanganui-o- Hei/Mercury Bay perspective

Cook had the *Endeavour* heeled and the hull scrubbed while he was in the bay. On 9 November [1769] he assisted his astronomer to observe the transit of Mercury across the face of the sun, which in turn allowed him to determine New Zealand's longitude (and the position of Mercury Bay became the pivot for Cook's chart of the whole country). Near the same stretch of shore, on Cook's Beach alongside the Purangi River, the navigator claimed possession of the surrounding countryside in the name of King George III.

—Michael King, *The Coromandel*

In Chapter Four, I connected insights from the political ecology and planning review with the framework to diagnose adaptation barriers in order to disclose where adaptation stands in the community of Te Puru on the Coromandel Peninsula's West Coast. While I focused on the issue of coastal erosion, I also highlighted flooding and general climate volatility as main adaptation stressors. I documented that the voices from the Te Puru community reveal a sufficient understanding to overcome the barriers in the Understanding Phase. Nonetheless, as a closer examination of the Planning and Management Phases in Chapter Seven will

underscore, the adaptation process ‘jumps the rails’ soon after. For the Te Puru community, this means that unless key planning and management barriers are addressed and overcome, climate change adaptation will remain understood in principle but inadequately addressed in practice.

However, Te Puru is rather different to Te-Whanganui-o-Hei/Mercury Bay. Te Puru is a small, comparatively exposed and vulnerable settlement on a flood delta. Te-Whanganui-o-Hei/Mercury Bay, on the other hand, is a natural harbour approximately 10km across with approximately 20km of shoreline and five ‘main’ beaches. Beaches such as these are precisely what upmarket coastal development is in search of: iridescent turquoise ocean and glaring white sand beaches less than three hours drive from the country’s biggest city – a veritable seduction for those who can afford it. According to Hopper Developments it will not be long before this part of the Coromandel will be in a position to “deliver all the amenities that are enjoyed in larger urban centres” (Hopper Developments Ltd, 2011, para. 2). Whitianga, the main settlement of the bay, has already been transformed into a resort town within a few decades and is projected to continue to grow at an unprecedented rate (Beston, 2005). Put simply, Te-Whanganui-o-Hei/Mercury Bay is a magnet for everyone who can afford it and seeks coastal bliss, resulting in a by far more contested setting than in Te Puru.

In this chapter, I use the same approach as in the previous chapter of describing a community-wide understanding of climate change adaptation. My approach is based on the interviews conducted, the framework to diagnose adaptation barriers by Moser and Ekstrom’s (2010) and coastal erosion as politically volatile or hot issue of concern yet controversy and unreconciled locally and anticipated to get much hotter with climate change. In doing so, I enable a direct comparison with the Te Puru community, which, together with the Harataunga/Kennedy Bay community (following chapter), makes it possible to paint a picture of adaptation planning and management on the Coromandel as a whole (Chapter Seven). Before I present the

local stories and insights, however, I briefly introduce Te-Whanganui-o-Hei/Mercury Bay.

6.1 Te-Whanganui-o-Hei/Mercury Bay

Te-Whanganui-o-Hei/Mercury Bay is a large bay located on the eastern side of the Coromandel Peninsula. Captain James Cook observed the transit of Mercury in November 1769 which gave the bay the name it is known by today. Traditional Māori refer to this bay as the great bay of Hei: Te-Whanganui-o-Hei. Despite the name Te-Whanganui-o-Hei not used or seen often, by using both the Māori and the English name, I endeavour to communicate the presence and influence of local Māori as the aboriginal owners of this land as indispensable.

On the shore of this large natural harbour lies the bay's main settlement, Whitianga. The majority of the locals who have participated in this research were based in Whitianga. However, the snowball-sampling approach (see Methodology, Chapter Two) opened doors to community members in other parts of the bay: Wharekaho/Simpsons Beach to the north and Cooks Beach to the south. In order to do those narratives justice they are included in this bigger picture of Te-Whanganui-o-Hei/Mercury Bay. Nonetheless, the primary focus of this chapter lies on Whitianga.

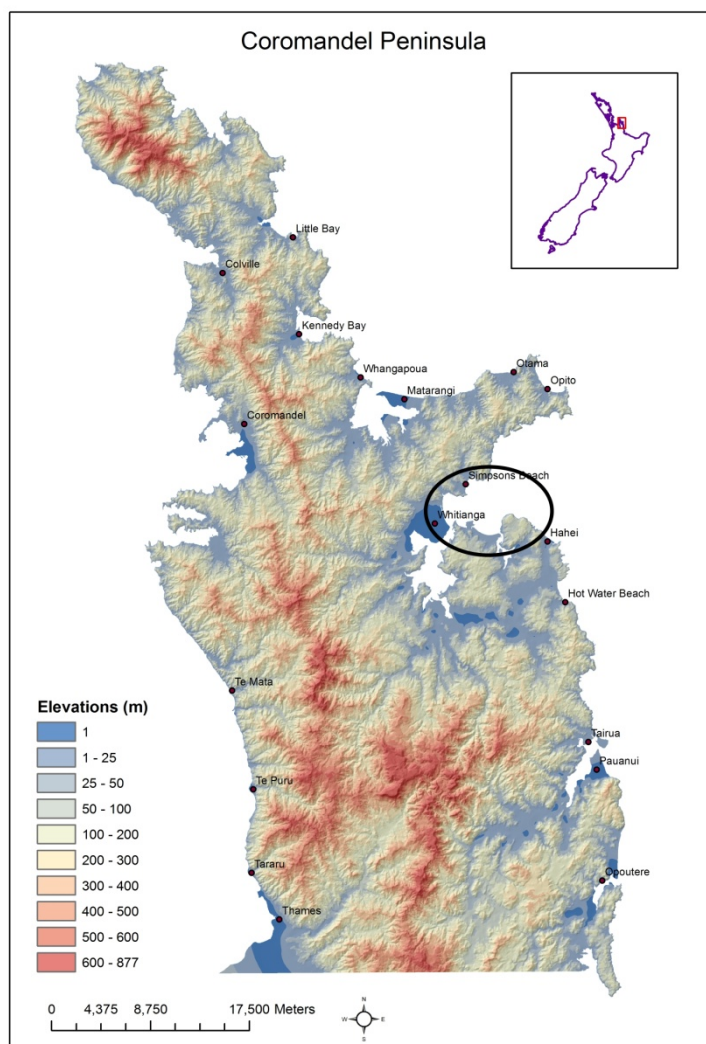


Figure 6.1: Location of Te-Whanganui-o-Hei/Mercury Bay (map produced with data from the Waikato Regional Council).

In Whitianga, currently approximately 4000 people, of which 80% are of European descent, live in 1700 occupied dwellings (Statistics New Zealand, 2007b). Whitianga has had the largest increase in number of new dwellings on the Coromandel Peninsula. The total number increased by 1059 between 1991 and 2006 and the number of unoccupied dwellings has almost doubled in the 10 year period between the 1996 and 2006 census to 38.5% (TCDC, 2007). This has happened at such a fast pace that, according to some community members, council was not able to control the development adequately (Beston, 2004). Unfortunately, the 2013 census was not yet available at the time of writing but undoubtedly this figure has risen

substantially in the past seven years since the previous census. Other parts of Te-Whanganui-o-Hei/Mercury Bay such as Cooks Beach are estimated to be composed of approximately 80% holiday homes (Merv Gardiner, Richardsons Real Estate, pers. comm., 2013). According to the Coromandel Peninsula Blueprint (Beca, 2007), Whitianga's summer population sextupled to 21,680 in the summer of 2003/04 and rose to 14,810 in the summer of 2005/06. Whitianga's permanent population is projected to reach 6000 by 2040 which further underlines the "unprecedented" and "extreme" changes the area has experienced (Peart, 2009, p. 160). *Te Ara*, the Encyclopaedia of New Zealand describes Te-Whanganui-o-Hei/Mercury Bay as "the Hauraki–Coromandel's fastest-growing area ... [with] extensive flats for expansion" (Monin, 2012a, para. 11).



Figure 6.2: The small coastal farming community and major timber port of Whitianga in August 1972 (Alexander Turnbull Library, Wellington, NZ, Ref. WA-70530-F).

The “extensive flats for expansion” (ibid.), however, are comprised of productive farmland (cf., Figure 6.1; Figure 6.2; and Figure 6.7) and lie merely a few feet above sea level (Figure 6.5), exposed to a range of coastal hazards experienced in the past (Figure 6.3). Natural coastal hazards such as high-magnitude storm events are projected to be exacerbated by climate change (Stewart, Leonard, Johnston, & Hume, 2005).



Figure 6.3: An attempt to protect Whitianga from coastal inundation during a storm event (NIWA, 2007).

Beginning in 2001, Hopper Developments commenced transforming 230ha of coastal farmland into 5km of canals allowing for over 1500 buildings. According to the developer's website, this development "is comprehensively planned" and adds "vibrant new dimensions to the already popular coastal township of Whitianga" (Hopper Developments Ltd, 2011, para. 2).



Figure 6.4: A section of the *Whitianga Waterways* coastal canal development photographed from the developer Leigh Hopper's holiday home (photo by author, 2010).

However, political ecology insights demonstrate that “ecology, economics, and politics interact” when new economic activities modify the landscape (Ariza-Montobbio, Lele, Kallis, & Martinez-Alier, 2010, p. 877). Indeed, a local longtime resident (2012, pers. comm.) confirms that not everyone sees this “vibrant new dimension” from a developer’s perspective:

It was so wonderful and lovely and wild when we were children. There were two baches on the beach. Along the other end there were two houses up on the hill, which makes sense. Those Hopper brothers have a lot to answer for. I think they want to put up a bronze statue too. I read something about that recently. This is why my heart will stop beating one of these days. I just can't handle it: it's so horrible ... just too much.

Apart from the above described impact on traditional community structures, the conversion of farmland for residential development or sub-urbanisation, in general,

represents a “serious environmental concern” resulting in “land degradation” (Levia, 1998, p. 123).

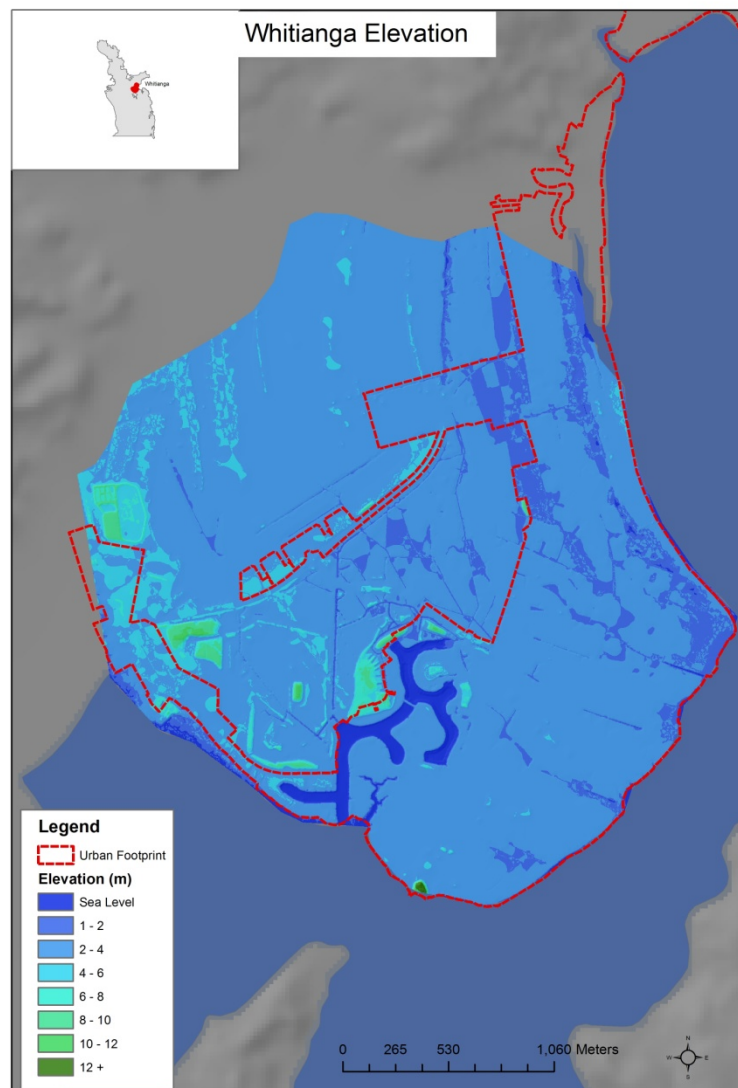


Figure 6.5: LIDaR generated map showing Whitianga’s low elevation (data from Waikato Regional Council, 2012).

These days, sub-urbanisation in Whitianga is required to take into account projected sea level rise as part of the consenting process based on guidance from the Ministry for the Environment (MFE, 2008d). Arguably though, given the area’s low elevation, any development is precarious against the background of sea level rise and increased magnitude and frequency of hazardous events. The following

map, based on LIDaR data, confirms this point. Despite the Coromandel Peninsula Blueprint's goal of "keeping development away from valuable soils for farming" (TCDC, 2013b, p. 2), further farmland conversion on a coastal flood plain is planned on Te-Whanganui-O-Hei/Mercury Bay's southern side at Cooks Beach, as the following article (Figure 6.6) highlights.

When I interviewed the coastal canal developer Leigh Hopper in 2010, he described himself as "agnostic" when it comes to climate change. Indeed, Hopper has no doubt about the location or the type of development the Waterways represent. Freeman and Cheyne (2008), however, challenge this position and see characteristics of gentrification mirrored in such rapid and unprecedented expansion of large and lavish houses to coastal areas in New Zealand. Another longtime resident (2012, pers. comm.) argued that "the [Whitianga] Waterways have caused a lot of problems" and that this "development should not have happened". According to the same longtime resident, the problems are both social ("it's not about us anymore") and ecological ("the whole bay has changed since... I've lived here all my life and I can just see the change").

Beach section up for sale

A large-scale urban subdivision is looking increasingly likely for holiday hot spot Cooks Beach.

A 22-hectare area of farmland, opening on to the picturesque Purangi estuary, has been put up for sale in the coastal Coromandel settlement.

The land, at 720 Purangi Rd, has long been earmarked for residential development, with the potential for 220 dwellings realised after Thames-Coromandel District Council granted consent for subdivision in 2009.

The vendor is the Guardian Trust, acting for the local Harsant family who have been longtime landholders.

The land has a rateable value of \$1.2 million. Tenders opened last weekend and will close on Tuesday, October 22.



WATERFRONT VIEWS: A 22-hectare section on Cooks Beach opening on to the waterfront is up for sale, tagged for a 220-house residential development.

Richardsons Real Estate agent Phillip Dawson said despite a tough property market, he expected to see renewed interest in the area.

“This is the last piece of the original farmland of Cooks Beach,” Mr

Dawson said. He said the vendors were open to all tenders, including those not for residential development, but thought the most likely buyer would be a developer looking to invest long term in the residential plan.

“It’s a logical extension of the existing development that’s been going on since the 1950s here,” he said.

“The structure plan has been in place for a long time, it’s always been tagged as potential development, and once (residential development) started in the

1990s and 2000s, it’s looked like a natural extension.”

Mercury Bay Community Board member Paul Hopkins said he expected a mixed response over the sale from the local community.

“I don’t know whether it’s the best thing for Cooks Beach to have so many sites, but it’s there,” Mr Hopkins said.

“Most locals know it is there for redevelopment . . .

“The people who’ve built around it will have known that down

“This is the last piece of the original farmland of Cooks Beach”

– Phillip Dawson, Richardsons Real Estate agent

the track it would be subdivided.”

He said local infrastructure had been planned with the development in mind, leaving Cooks Beach residents saddled with the extra costs while they waited for their new neighbours.

Seeing the development move forward would ease some of the pressures on rate-payers, Mr Hopkins said.

“With the sewerage system we have in Cooks Beach, local residents pay a district-wide fee and also a Cooks Beach charge . . . we’re being pinged twice if you like.

“We’re propping up those 220 sections that would otherwise alleviate the cost . . . it’s not being used fully yet, so people who live in Cooks Beach won’t get respite until the time the sections are sold.”

Fairfax NZ

Figure 6.6: The last remaining piece of coastal farmland up for sale at Cooks Beach (Hauraki Herald, September 12, 2013, p. 4).

Not only did the median price of dwellings rise from four to twelve times the mean annual wage between 2002 and 2007 (Peart, 2009) but a displacement of modest holiday ‘baches’ has resulted in “second home suburbs on the beach” (H. C. Perkins & Thorns, 2006, p. 78). Collins (2013, p. 114) points out that this shift has been “unsympathetic to historical styles of coastal housing in New Zealand”. A local longtime resident interviewed (2012, pers. comm.) describes the rapid change in Whitianga as follows:

When we were kids our parents used to take us to Whitianga which was just a very small village community and we were related to probably half the people there. It was a logging and milling community as well as farming – the loggers and Kauri cutters turned to farming. At that time all along the beachfront there were swamps behind. At a certain time the eels would come from out of those swamps and they would go to the mouth of the river ... millions of them – just a sheet of eels would rise out of there and go out to sea and all these interesting and wonderful things happened.

Then along came the builders and they filled all the swamps in. In their idiocy they built cellars below their houses. They were flooded every time there was a huge sea. I was there when the tidal wave from Chile⁷⁴ came across and it flooded everything. All they had to do was ask the old inhabitants who were there but they came in and they built all over those swamps and then they put that Marina in. When the tidal wave came there was no way out. The water rose up in the streets and everywhere. Now they are talking about putting an old people's home there but they will be the last ones to escape. They are teaching school children how to evade tidal waves but they have to walk from the school to a back road before they can go up the hill. They won't have chance. Even the fire station is beachfront...

⁷⁴ The Chilean tsunami struck New Zealand's East Coast on the 23rd and 24th of May 1960 and caused wide-spread damage to low-lying coastal areas such as Te-Whanganui-o-Hei/Mercury Bay (de Lange & McSaveney, 2012). Many longtime residents interviewed referred to this particular event in the context of sea level rise, despite the two being unrelated. The difficulty of implementing more restrictive coastal settlement policies following a tsunami is discussed by McGranahan, Balk, and Anderson (2007). Using the example of Sri Lanka, Schipper and Pelling (2006, p. 30) criticise that policymakers do not take "the reconstruction phase as an opportunity to take into account the potential adverse effects of future climate change-induced sea-level rise in their plans". A contemporary example is the rebuilding of Christchurch (New Zealand) following the 2010 and 2011 earthquakes, where, according to Platt (2012, p. 16), the replacement costs (at 2010 prices) for flooded building contents in a 0.8m sea level rise scenario is estimated to be NZ\$ 1.2 billion.

Unlike Te Puru which, for the time being, has reached its growth limit due to its pre-determined area currently suitable for settlement, Whitianga is continuously expanding on land ostensibly ideal for (short-term) development.

Notwithstanding, as New Zealand's National Institute of Water and Atmospheric Research (NIWA, 2011, para. 9) points out, "[f]orward planning is crucial to adapt to potential impacts of climate change at the coast". The following comparison of Whitianga in 2007 and 2030 demonstrates the projected sub-urbanisation and raises questions about the level of forward planning.



Figure 6.7: Whitianga in 2007 (left) in comparison with a projection for 2030 (note the uptake of farmland and the expansion of coastal canal development (www.creatingfutures.org.nz/Waikato Regional Council)).

From 2009-2010, NIWA undertook unprecedented work in an attempt to engage with communities as part of a Coastal Adaptation to Climate Change (CACC) project (Blackett, Smith, et al., 2010). NIWA selected Whitianga as the ideal community to become familiar with climate change adaptation narratives due to the community's above described unique development pre-condition and also experience with coastal hazards. The project's main intentions were (i) to get the 'right' people to the table; (ii) achieve consensus and representative decision-making; (iii) personalise the impacts of climate change; and (iv) enable an appropriate and meaningful inclusion of scientific information. The value of the work undertaken by

NIWA lies in the provision of space for engagement and progress toward climate change adaptation.

However, in line with the findings from the Te Puru community (previous chapter), wider climate change adaptation research (Adger, Lorenzoni, et al., 2009; Berkhout et al., 2006; Dovers, 2009; Parry et al., 2007), and the framework underlying the approach selected for this case study (Moser & Ekstrom, 2010), the approach taken by NIWA has not lead to a “debate towards negotiation of a final outcome or response” (Rouse, 2010, p. 6). In other words, NIWA have primarily undertaken a stock-take of how the problem is understood and what locals value that is at risk from climate change and requires adaptation. The following sections demonstrate in what way such a stock-take represents a valuable contribution towards overcoming barriers.

6.2 Understanding climate change adaptation

In this section, I epitomise the common adaptation barriers in the Understanding Phase through key insights provided by locals from and associated with Te Whanganui-o-Hei/Mercury Bay. The Understanding Phase is divided into three stages: (i) problem detection; (ii) gather/use of information; and (iii) the (re)definition of the problem. In total, these three stages are further subdivided into 16 individual barriers which may arise within the three stages.

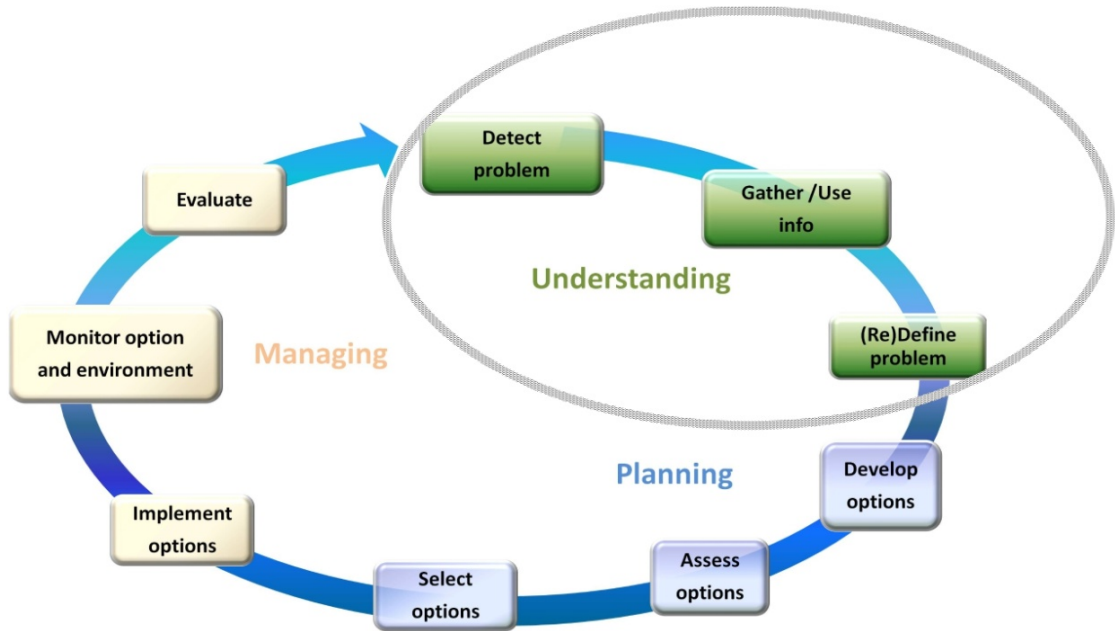


Figure 6.8: The first phase of the adaptation process includes the detection of the problem, the gathering and use of information and the (re)definition of the problem (after Moser & Ekstrom, 2010).

In total there are four barriers identified by Moser and Ekstrom (2010) likely to arise within the first stage of problem detection (Figure 6.8). The first barrier is the actual existence of a signal. Ekstrom, Moser, and Torn (2011) point out that the signal can manifest itself in a variety of ways such as a hazard/disaster, the coverage of climate change in reports or scientific findings, a political statement or even a policy change. As discussed in the context of Te Puru, one such policy change has resulted in the local coastal development set-back regulations (cf. Focus, 2012), which will be discussed in detail in Chapter Seven.

6.2.1 Barriers in the problem detection stage

“Do [individual] local actors detect, receive, perceive or recognise a signal?” is the very first question that needs to be answered. Generally less exposed than Te Puru and with a seemingly irresistibly coastal allure resulting from the impressive coastal scenery, the interviews have revealed that an actual signal is received, perceived and recognised, albeit to a considerably lesser extent than in Te Puru.

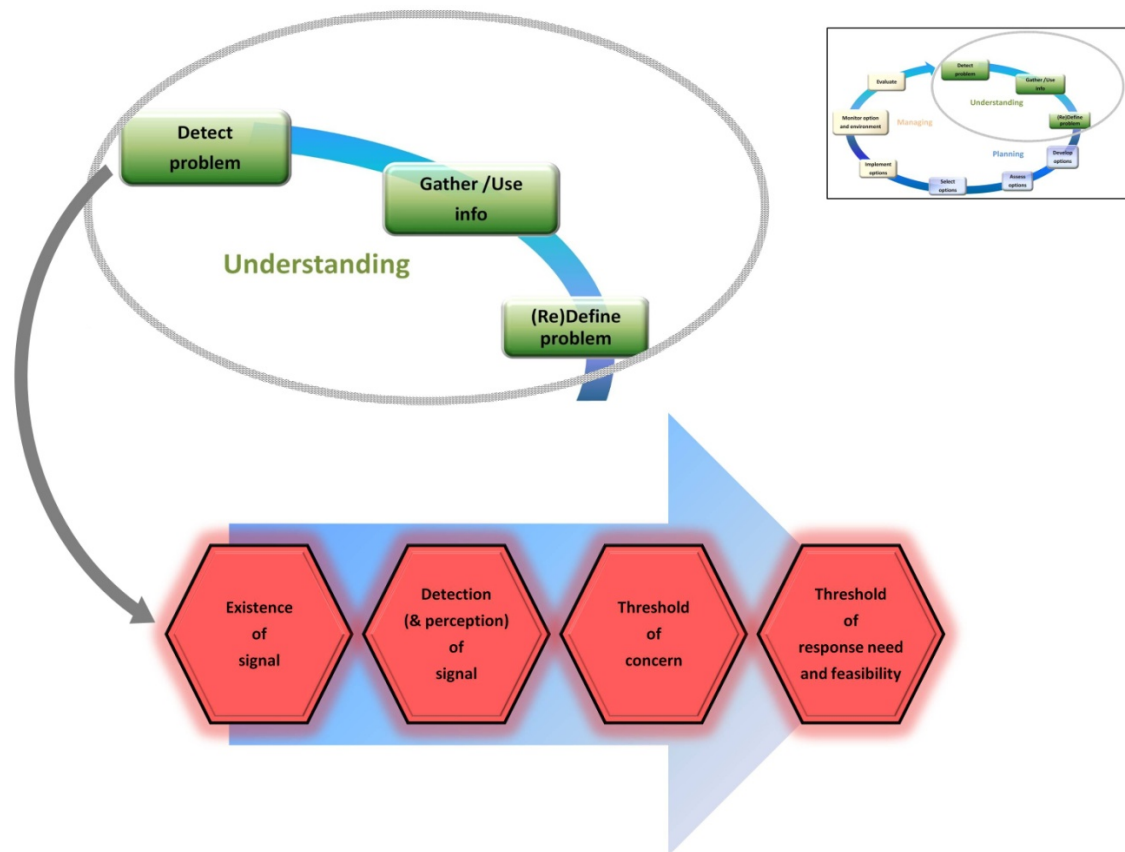


Figure 6.9: Barriers in the problem detection stage

Independent of a fundamental doubt or denial in climate change, which the majority of those interviewed have demonstrated, the actors’ ‘mental model’ appears to filter out signals stronger in Te-Whanganui-o-Hei/Mercury Bay than in Te Puru. This becomes evident in the seemingly insatiable longing to build houses as close as possible to the ocean (for example, see Figure 6.10). After all, the lived experience of climate change in this area is as much about the fickle climate and physical process as it is about local identity of beach holiday and a ‘no worries’ summer feel. This lived experience appears to result in a situation where signals are detected, yet the impression remains that all is good and there is little to be concerned about. In the context of the lived experience of climate change, Anderson (2008, para. 1) writes that “there’s always that dream in the back of their mind that they’ll be wrong and that [things] will go back to the way [they] were”. This insight is most strongly reflected in the snapping up of beachfront property in the past few decades where those buying up the land wish for things to stay the

way they were, despite actively partaking in the ‘destruction of paradise’, analogue to John Milton’s epic poem *Paradise Lost* from 1667. However, climate change appears to remain as “no more than background noise” (Brechin, 2008, p. 467).



Figure 6.10: Waterfront house at Whitianga (Holiday Houses, 2013).

The following insight by a local long-term resident interviewed (2012) confirms this initial situation:

I am amazed by the amount of money people are putting into their buildings. Being so close to sea level there is immense potential for damage. Maybe they think “it doesn’t seem to have happened in the past, oh well, if it happens, it happens”... I often think about this. I don’t think I would do that.

Social psychologists Victor Gecas and Peter Burke (1995) explain that people distance themselves from troubling information, and, in the process of doing so,

distance themselves from reality. This is done in order to maintain a coherent meaning system. “I believe that we are in some sort of a cyclic pattern” a beachfront property owner from Cooks Beach at the southern end of Te-Whanganui-o-Hei/Mercury Bay said to me (2012). This property owner in particular and this beach in general are heavily affected by increasing erosion requiring urgent consideration and action⁷⁵. Nonetheless, this property owner stated that, to him, it is “something we can’t change” claimed that he is “not unhappy to live with it” and further added “I don’t like to get too concerned about it; we can worry about it once it takes shape” (2012, pers. comm.).

Across the board, all locals interviewed in Te-Whanganui-o-Hei/Mercury Bay have shown to struggle with the very first subprocess of the Understanding Phase. “I don’t think that we are facing consistent erosion as such” one beachfront property owner (2012) told me. Wherever beach erosion is identified, there is a strong belief in the aforementioned techno-fixes alleviating any consequences and masking the bigger problem of climate change. “In the year 2000, for example,” a local long-term resident (2012) explained to me, “we had horrible weather for about two weeks. People say to me that it’s climate change but I’m thinking hey, we’ve had this before. I really don’t think it’s any different”.

Gecas and Burke (1995, p. 50) confirm that “perception, cognition and retention of self-relevant information are highly selective depending on whether the

⁷⁵ According to an article under the heading *Plan to protect beach rock solid*, Cooks Beach beachfront owners have founded an incorporated company called *Cooks Beach Wall Ltd* (Fairfax NZ, 2012). In 2013, the company completed a 400m rock wall between the beach and private properties, of which only two are permanently occupied (TCDC, 2012b). The article (Fairfax NZ, 2012) states that “[e]ach of the property owners will be a company shareholder”. However, the New Zealand companies office (Ministry of Economic Development, 2013) discloses that all company shares are owned by one person alone, Henry Sinclair (who does not live in a beachfront property). Interestingly, as the New Zealand companies office further discloses, Henry Sinclair furthermore owns shares in, amongst others, real estate, concrete, accounting, business and bankruptcy services, consulting, and holiday home rental. Having a company set out to generate profit for its shareholder(s) in charge of protecting private property in a situation where public values are likely to be compromised raises highly topical questions with regard to social responsibility, and power and politics, as discussed subsequently. In a situation like this, an answer to the question of who is set out to profit from such a rock wall is both beachfront property owners as well as the business in charge of building the wall. It is fair to assume that, in such a situation, public and ecological values are unlikely to be at the top of the agenda.

information is favourable or unfavourable to one's self-conception". In the case of actors from Te-Whanganui-o-Hei/Mercury Bay, the detection of climate change as a problem is unfavourable both on an individual as well as on a social level. Norgaard (2011) highlights the emotion factor and that it effects cognition in a variety of ways. In referring to Lifton (1993), Norgaard (ibid., p. 89) explains that "emotional needs and desires" influence the detection, reception, perception or recognition of a signal. Te-Whanganui-o-Hei/Mercury Bay residents feel strongly attached to 'their' bay and are emotionally very committed to the scenic beauty. As such, it is not surprising that the problem remains in the background. If there is a general acceptance that there is a problem putting this beauty at risk, it would be emotionally highly disturbing. Not without reason there was a recent message on one of the local cafés blackboard saying "Another day in paradise"⁷⁶.

Over the past few decades Te-Whanganui-o-Hei/Mercury Bay has become a playground for those who can afford it. Issues of power, as targeted by political ecology are indispensable when examining the environmental conflicts taking place (Blaikie & Brookfield, 1987; Peet et al., 2011). Who benefits from the decisions made within the governance system and how do these decisions impact on the greater context of the bay? Why should it be possible for some to protect their property to the detriment of the public? Why do certain rules apply to some and, seemingly, not to others? In whose interest is shoreline armouring undertaken, who profits from decisions made and who loses out? How, Few (2001) asks, is power implemented to resolve certain situations? Coastal erosion is not only a precursor of what is to come at increased size and magnitude due to climate change (Critto et al., 2012), it is also a problem which has considerable implications for the physical environment and everyone involved. It is clear that storm intensity, frequency and sea level rise will further intensify coastal erosion (Corbella & Stretch, 2012; Komar

⁷⁶ Ironically, *Bachcare*, one of the companies the afore discussed owner of *Cooks Beach Wall Ltd* (the company that is determined to complete a 400m shoreline rock wall in Cooks Beach) owns shares in, offers a beachfront holiday house in Te-Whanganui-o-Hei/Mercury Bay under the title *Paradise Found* for rent (Bachcare, 2013).

& Allan, 2008). Furthermore, it is immensely contested locally and rhetoric and reality could not be further apart.

At the time when I was conducting interviews in Te-Whanganui-o-Hei/Mercury Bay, an incident highlighting the local role of power and politics occurred. An ongoing erosion problem was dealt with through ad-hoc rock armouring which is contradictory to council rhetoric, policies, and scientific findings (Airoidi et al., 2005; MFE, 2008c; NZCPS, 2010; WRC, 2009), all of which emphasise the importance and potential of soft coastal defences and promote natural systems. In April 2012, council workers dumped rocks on Brophy's Beach, Whitianga to protect a reserve behind the beach without consultation or resource consent. Councillors had before demanded action to 'protect' the coast which, to them, was not happening fast enough (Preece, 2012b, Figure 5.11). Soft coastal defences, which are sustainable and represent a long-term approach include beach replenishment, dune stabilisation, and managed retreat, whereas the most widely used hard defences are coastal 'rip-rap', sea walls, groynes, or revetments. Hard defences are by nature short-term solutions and typically lead to increased erosion in adjoining sections of the coast (Vonortas & Linquti, 2012). Then-Mayor Barriball confirmed in the year 2010 (pers. comm.) that council "now give[s] *soft* defences a preference over *hard* defences". Coastal residents, on the other hand, tend to be in greater favour of shoreline armouring (P. W. French, 2001).



Figure 6.11: Newspaper article reporting of overnight emergency coastal protection measures at Whitianga (Hauraki Herald, April 13, 2012).

Local Councillor Marray McLean has demanded “decisive action” and “not just another meeting” which seems to be the motivation behind taking the matter into his own hands (Preece, 2012a, Figure 5.12).



Figure 6.12: Local Councillors take coastal erosion into their own hands and push for more hard coastal defence in Whitianga (Hauraki Herald, August 3, 2012).

Instead of engagement with the actual problem that coastal erosion is “the biggest issue facing the Mercury Bay ward” (Preece, 2012a, Figure 5.12), and projected to pose a much bigger problem with climate change, a short-term, ‘business as usual’, and ad-hoc approach prevails.

As it stands, hard shoreline armouring already backs much of the beach area in Te-Whanganui-o-Hei/Mercury Bay. A local longtime resident interviewed (2012, pers. comm.) pointed out the following example of high tide beach-loss as a result of shoreline armouring: “When I was a kid we could walk all along the beach without ever worrying about the tide, now Brophy’s Beach is only a quarter of what it was”. The following excerpt of my interview with a local council senior planner (2012) provides insight into the messiness of the situation, particularly when it comes to ad-hoc shoreline armouring:

Paul What do you make of ad-hoc protection measures such as those witnessed in Whitianga recently?

Peter Well, the RMA provides for that. How it’s supposed to work of course is that it is an emergency and it is *unforeseen*. But of course it *is* foreseen: There *will* be a big storm and there *will* be erosion. We know that. So whilst it might constitute an emergency, it’s certainly foreseeable. So the argument should

go – and of course we are looking at staunchness on the part of senior council staff and elected members – is that council should say “look, you’ve got no one to blame but yourself, so why do you now expect the public agency to rush around in small circles trying to – again – put more rocks on the beach, compromising public values, certainly looking after private interests but not looking after anyone else’s interest.

Paul But that’s not reality, is it?

Peter Of course we all know that probably with a storm raging and if an elected member is there, even if they are not allowed to, they’ll say “yes – for heaven’s sake: dump rocks!”. What is supposed to happen in that situation is that the rocks have to either be removed ... who pays for that? Or a resource consent is sought ... who goes for the resource consent? Who pays for the resource consent? So it’s all a bit hazy...

Paul Do you see a solution to the problem?

Peter I have some sympathy with where the regional council is coming from which is to identify these sorts of zones. Then it is something that is no longer with local decision-makers but sits with regional council who are a bit more removed and perhaps can see the wider context and understand the principles. The thing is if you are an elected member living in an affected community and you’ve got your friends and neighbours saying “hey, look, my property is getting washed away”, of course you are going to do something about it. Politics at the local level are fuzzy and it’s a tricky one.

The above insight by the local council planner interviewed provides an insight into emotive and direct experiences influencing political will. Especially in a conservative community setting “in which innovation is not embraced” (Ekstrom et al., 2011, p. 21), the initiating of an adaptation process is not unlikely to be hampered by political motives and power networks.

The interviews have revealed that the final barrier within the problem detection stage of the framework (threshold of response need and feasibility) represents a

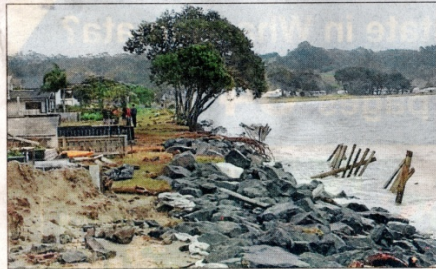
further significant stumbling block. While actors clearly perceive a necessity to respond to the signal of coastal erosion, the response is not based on an agreement of the actual problem being part of a much bigger problem. As previously discussed, this is precisely the point of departure for a techno-fix solution (Gardiner, 2010). Climate change appears to be of little overall concern and local councillors are occupied with maintaining the status quo. The words of a local longtime resident interviewed (2012, pers. comm.) further underline the dilemma:

What would need to happen is a law change but the current government would prevent that. Politicians in all parties would have to be passionate about making a long-term change. They need to wake up. This is not only affecting a few. For example tourism: How many people come to Whitianga for the beach? Now half of it is rock wall. I can see that happening all along the coast. I just see disgusting kind of people scrambling on top of each other to get glory and in the meanwhile nothing sensible is happening. Nothing!

Likewise to Te Puru, the creeping problem of coastal erosion coupled with the naturally highly variable climate⁷⁷ make it difficult to detect the signal of climate change. Furthermore, Ekstrom, et al. (2011, p. 21) point out, a “lack of understanding may also be the principal cause behind not being able to interpret a signal’s meaning, to spell out its implications, and hence to establish the appropriate sense of urgency, caution, or ease”. Given that the financial stakes are high and the entire area achieves large profits for and from a wide range of investors, not least local government, a lack of understanding is not absurd.

⁷⁷ Variability is predominantly attributable to changes in the Interdecadal Pacific Oscillation (IPO) and the El Niño-Southern Oscillation as well as dominating westerly winds (MFE, 2009a; Salinger et al., 2001; Ummenhofer & England, 2007).

Night work saves the day



HIGH TIDE: The emergency seawall at Cooks Beach the morning after the storm.

By MICHAEL DOBIE

As the wind and rain lashed Cooks Beach and the tide surged late on Tuesday, contractors in the middle of building a new rock seawall took emergency action to prevent coastal properties from erosion and flooding.

The workers from Higgins, contracted to build the wall by a group of property owners on Captain Cook Rd, moved rock from their stock until around midnight.

The workers had knocked off for the day and gone back to their lodgings, said Steve Hosken, who heads Cooks Beach Wall Ltd, the company residents formed to have the wall built to protect their properties from erosion.

Higgins is based in Tauranga, and so the workers were staying in temporary accommodation.

But one of the residents was watching the rising tide with a worried eye.

The new wall only extended as far as her property and so she got workers to come back to shore it up, Mr Hosken said.

The new seawall is replacing older structures protecting some of the properties, including a dilapidated timber wall.

"The contractors decided to dump rock behind the timber wall as it was being washed away," said Mr Hosken.

"There would've been a lot of erosion otherwise."
Thames-Coromandel District

Council engineer Steve Bremner, based in Mercury Bay, said the shoreline of the woman's property was being eaten away.

At the eastern end of the beach, a lot of sand was stripped away from the dunes at the reserve and a pine tree "ended up in the surf", said TCDC planning manager Peter Wishart.

Waves spilled over the newly built section of seawall and a bit of water entered one unoccupied house, he said.

Another house thought to have been undermined by the sea was inspected and found to be undamaged.

But the wall already built stood up beautifully to the sea's pounding, Mr Wishart said.

Figure 6.13: Emergency action to defer a persistent coastal erosion problem at Cooks Beach (Hauraki Herald, September 27, 2013).

As it stands, coastal property is in need of protection so that the short-term profit architecture the area depends upon can be upheld at least for now. The signal of coastal erosion has occurred in the past, it keeps re-occurring, and it is unequivocal that coastal communities face "increasing levels of coastal erosion" in relation to sea level rise (Stocker, Kenchington, Kennedy, & Steven, 2012, p. 7). In the absence of sound information followed by understanding with regard to the actual signal, the logical consequence appears to be to maintain the status quo and fix what needs fixing here and now. A local longtime resident (2012, pers. comm.) provided the following insight confirming the points made so far:

Well, one way or the other we pay for it. We either lose land or we pay for these ugly rocks and the loss of the beach and tourism. If you do something to nature you need to consider the long-term. And that's what's happening. We are doing something to nature but we are addressing it in a temporary way. We've already thrown millions of dollars at the coastal erosion problem and we are worse off than ever before because we are not addressing the bigger picture. Those responsible are not made to look outside the square and see the ongoing problem. Politicians just change things in our flawed system

and then the next ones spend another three years changing it back. And power corrupts.

In many parts of Te-Whanganui-o-Hei/Mercury Bay the techno-fix to coastal erosion by means of coastal armouring has already resulted in significant loss of high-tide beach. Such a loss represents an impact on ecosystems as well as public coastal amenity values. But what are the alternatives? The New Zealand Transport Authority (NZTA) representative interviewed (2012) feels that any other form other than hard defences is equal to “just walking away”. Furthermore, the NZTA representative (2012, pers. comm.) points out the following:

You can't just let nature take its course. We are dealing with people who have invested money in the area. Authorities are here to provide services. Walking away is the same as saying “we don't really care”.

A regional council Project Manager (2012, pers. comm.) based in Whitianga highlighted both the complexity of the issue and the tendency of local institutions to be gridlocked and rigid or sticky (North, 1990):

I don't support rock walls; I like to see the dune system and the more natural environment. We've learned a lot over the years and the soft options are hopefully where we are more heading to ... but then again you drive along Buffalo Beach road (Whitianga) and you see *a lot of* rock. But what do you do when you've got multi-million dollar assets and a road that runs pretty much along the beach ... it comes down to money and a political will to make the hard decisions, I guess. None of these issues are straightforward; they are very complex. You can take a very purist attitude and say that they shouldn't be there but that's not how it works and that's why we struggle to do anything about it.

The institutional stickiness North (1990) refers to are part of adaptation reality, despite local institutions playing “a crucial role in influencing the ex ante adaptive

capacity of communities and the adaptation choices made ex post by community members” (Agrawal, 2010, p. 180). A further difficulty when it comes to a climate change associated signal produced by the system, is that the signal is amplified or attenuated through the media which provokes locals to exchange concerns, ideas and understandings (Hulme, 2009; Pidgeon, 2012).

However, what complicates matters is that the local media is completely silent on the issue of climate change. The biggest local newspaper, a longtime resident (2012, pers. comm.) confirmed, is “very establishment and doesn’t report on anything controversial [such as climate change]”. Indeed, the manager of the *Hauraki Herald*, when invited for an interview in 2010, replied that he does not “believe” in climate change and that he is “convinced” that “any abnormalities found in current climate are part of a natural cycle and natural fluctuations”. The problem is that local newspapers are essential for providing locally relevant information. While extreme weather events and the strengthening of local infrastructure to accommodate such events, as well as coastal armouring, are reported on, the link to the bigger problem of climate change remains absent. The only local Coromandel radio station *Coromandel FM* also declined an interview. The Station Manager (2012, pers. comm.) pointed out that *Coromandel FM* “has not and will not discuss climate change on air” and also highlighted the following:

Whist I accept there may be ignorance to a degree by a wide number of Peninsula residents; it's indeed true of the entire country. We do not have the qualified individuals to discuss in detail such relevant matters.

The question remains, after all, where else other than the local newspaper and local radio station could/would people exchange local ideas and understandings about climate change? Local media nurses a need for social affiliation and enables locals

to make sense of their identity in relation to the 'outside' world, otherwise defined as ontological security⁷⁸ (Giddens, 1991; Silverstone, 1993).

In Te-Whanganui-o-Hei/Mercury Bay, the response need and feasibility threshold (final barrier in the problem detection stage) would have been crossed, yet arguably not gracefully. Both questions posed by Ekstrom, et al. (2011, p. 22) whether there are logical actors to take on the detected problem, and whether there are already agreed upon ways of dealing with the detected problem must be answered in the negative. Ekstrom, et al. (ibid.) further highlight that "even in cases where actors believe in the severity of the detected problem and understand it intuitively or superficially, it still may be difficult to move forward with the adaption process because of the lack of prior experience and the lack of authority or institutional responsibility in dealing with the problem" (Moser, 2009a, quoted in Ekstrom, et al., 2011, p. 22). Consequently, an approach to subsequent barriers will carry the legacy of shortcomings in the first stage of the Understanding Phase. Interest and focus (the first barrier of the gather/use of information stage) are not developed sufficiently enough to warrant a progression in overcoming barriers and benefit climate change adaptation.

6.2.2 Barriers in the gather/use of information stage

A total of eight barriers comprise the gather/use of information stage (the second subprocess within the Understanding Phase, see Figure 6.14). The first barrier, interest and focus, has again confirmed the value of drawing from political ecology in a focus on culture, values, perceptions, and beliefs. The study undertaken by NIWA (Blackett, Smith, et al., 2010) has confirmed that the values of Whitianga locals are of high relevance to climate change adaptation. Knowledge coupled with

⁷⁸ A continuity of events, stable emotions and the absence of chaos in a person's life are the basic requisites for ontological security (Giddens, 1991). Climate change poses what cosmologist Stephen Hawking confirms as "one of the greatest threats posed to the future of human-kind and the world" (RTCC, 2012, para. 1), which represents a considerable challenge to ontological security.

awareness of such values is indispensable for addressing existing power structures in environmental conflicts (Martinez-Alier, 2002).

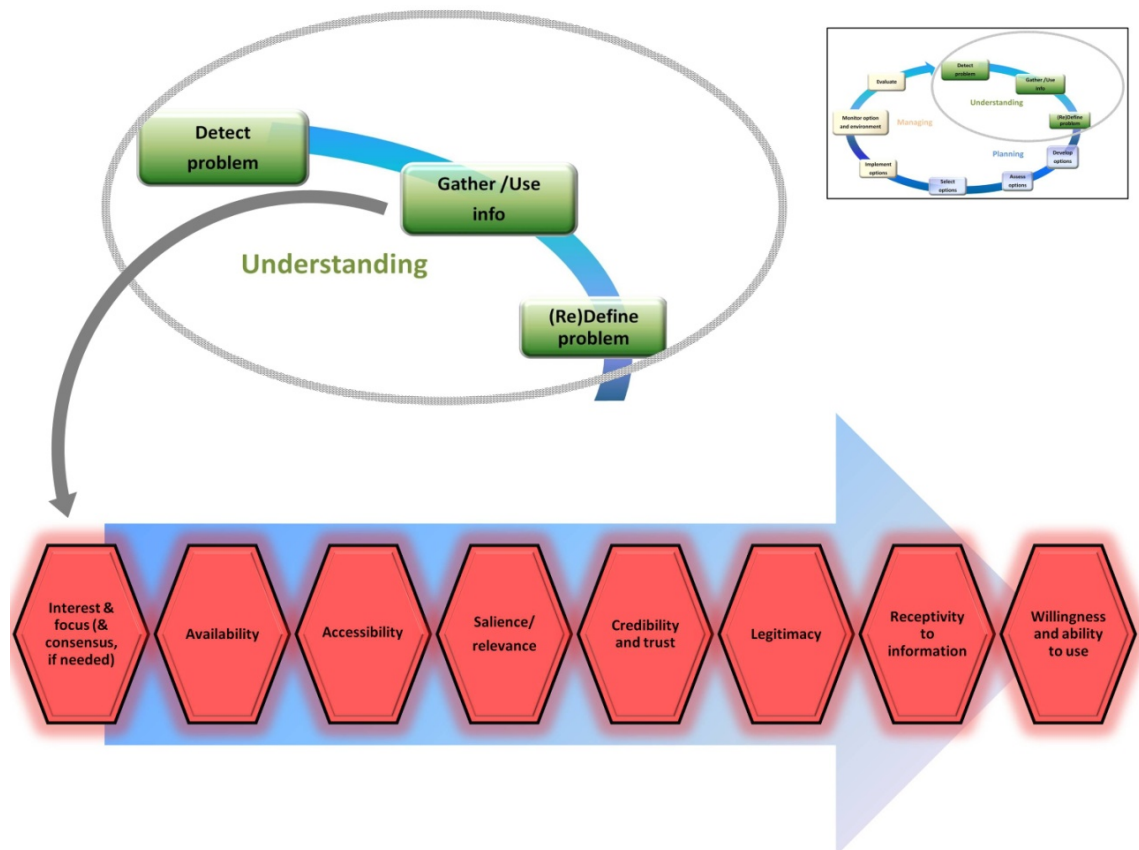


Figure 6.14: Barriers in the gather/use of information stage.

NIWA (2010) attempted to answer the question what Whitianga residents value the most in their community that might be at threat from climate change. In doing so, NIWA has addressed this phase's first overarching question: "What values, perceptions, and beliefs direct what information should be collected"? (Ekstrom et al., 2011, p. 23). Apart from finding that, in Whitianga, the "[c]onsideration of future adaptation strategies tend to be very low priority for the general public" (Blackett, Smith, et al., 2010, p. 1), NIWA has identified information on how to address contending values as paramount to climate change adaptation. The report (ibid.) states that locals' biggest concern with regard to climate change is that beaches become adversely affected while beachfront property owners wish to

protect their investment. The report, therefore, further confirms the value of examining coastal erosion as the prime climate change issue coastal communities are facing to date. Blackett, et al. (2010) conclude that the information that should be collected is what people value about their community and also what the likely conflicts will be as climate change impacts become increasingly evident. This process, the authors (ibid.) argue, will help develop options, which is subject of the Planning Phase (discussed in detail in Chapter Seven).

As it stands, however, the participant insights about the Understanding Phase demonstrate that the current barriers are too substantial to be overcome, which represents a hindrance to constructively addressing subsequent stages of the adaptation process. Power, politics and a preoccupation with the status quo stand in the way of addressing climate change adaptation barriers effectively. This does not mean that there are no adaptation planning provisions such as the coastal setback regulations in place. However, games of power and politics are played out and subsequently “undermine the capacity and willingness to make adaptation decisions” (Tribbia & Moser, 2008, cited in Moser & Ekstrom, 2010, p. 22028).



Figure 6.15: Closer and closer to the beach instead of further away remains the prevailing paradigm for development such as here at Wharekaho/Simpsons Beach (photo by author, 2012).

The above photo (Figure 6.15) and the story a local longtime resident (2012) told me illustrates such games of power and politics preventing:

It just doesn't make any sense to me why houses are now being built closer and closer to the sea. I just don't know ... but they are legal. I don't know who changed the rules in council, but somebody did. I can't think of a sensible idea why council would let people build so close to the sea. The people who just started building next door were allowed to build closer to the sea than anyone else (Figure 6.15). How can this happen? They don't tell us anything so we don't know what's going on. These people are property developers from Auckland, so I guess they just know how to work their way through council. They did go to the environment court, and they also chopped down a beautiful old Pohutukawa tree that was in their way....

[E]very time anyone complained to the council, they were told immediately. They got phoned and told who the person was and what the person said. So someone in council is repeating to them every time someone calls. The result is now of course that nobody dares to call anymore because people know that they might get taken to court. Everyone here is unhappy about this development. I really don't understand, and it is so sad to see all this spoilt. Why is there no coastal rule that applies to everyone? Things like this are happening all along the coast.

According to the above insight, the developers of this beachfront property are powerful enough to circumvent regulations and even intimidate others in the area by having influential ties with local government that they get reported who complains and what the complaint entails. As concerning as this insight is, my observations over time confirm that the above local (2012, pers. comm.) is probably right when saying that “[t]hings like this are happening all over the coast”.

Unless the barriers in the Understanding Phase are overcome successfully and clear authority and institutional responsibility is assigned, problems in later stages are inevitable (Moser, 2009a) (at the latest when establishing criteria for developing, assessing, and selecting options). As long as the issue of climate change is so heavily contested and there is a strong divergence in interests, power relations will shape the outcomes of public decision-making. Furthermore, as long as Te-Whanganui-o-Hei/Mercury Bay continues to attract wealthy absentee owners, long-term community interests are unlikely to be addressed constructively and the barriers in the Understanding Phase overcome successfully.

6.3 Climate change adaptation and the failure to develop

When examining the factors contributing to why adaptation does not seem to be progressing in Te-Whanganui-o-Hei/Mercury Bay, an analogy with the Axolotl (*Ambystoma mexicanum*) comes to mind. This neotenic⁷⁹ Mexican salamander lives its entire life in a larvae stage resulting from a failure to undergo metamorphosis, in other words, the larvae never develops fully. In a way, such a failure is a backward step in evolution (Clare, 2012). Just like the Mexican salamander, coastal climate change adaptation in Te-Whanganui-o-Hei/Mercury Bay appears 'stuck' in its larvae stage. All the Axolotl requires to transform, however, is a (administered) dose of thyroxine, a thyroid-stimulating hormone.

As expected, the situation Te-Whanganui-o-Hei/Mercury Bay is more complex and it would take more than one thing or the other to promote a 'metamorphosis'. The coastal communities in Te-Whanganui-o-Hei/Mercury Bay need to constructively address the barriers in place in order to aid decision-making, which is "not as straightforward as building adaptive capacity" (Moser & Ekstrom, 2010, p. 22030). Such a process requires more than prescriptive steps to overcome barriers. According to the adaptation framework by Moser and Ekstrom (2010), the adaptation process in Te-Whanganui-o-Hei/Mercury Bay has already stalled before it got going. Or, put differently, just like the Axolotl is fully functional and, for the time being, is able to survive, a changing environment can bring its end⁸⁰. In order to survive in a wider range of environmental conditions, an adaptive forward step would have to take place to ensure its survival.

Not surprisingly, the Axolotl is on the brink of extinction in the wild. If a system (or species, as in the case of the Axolotl) fails to adapt or transform and, consequently, becomes too vulnerable, it undergoes "unintended degradation" (Chapin et al.,

⁷⁹ Neoteny means that the adults reach sexual maturity without undergoing metamorphosis (R. Tompkins, 1978).

⁸⁰ Indeed, being aquatic in its larvae stage, the Axolotl fully depends on its lake environment which has been significantly altered by humans.

2010, p. 243). In Te-Whanganui-o-Hei/Mercury Bay, the current ideology based on existing value patterns appears to be that both the status quo and 'business as usual' must be maintained which currently presents itself as an insurmountable barrier. Furthermore, using coastal erosion as most obvious example, there are no logical actors taking on the problem and seeing it through, resulting in a rather messy adaptation situation stuck in present short term techno-fixes and parochial interests in safeguarding private property and financial investments. The local newspaper articles (Figure 6.11 and Figure 6.12) on how coastal armoring is dealt with by disgruntled local councillors based on their current understanding of the problem, underlines the issue. Coastal erosion illustrates that adaptation is not a matter of simple black and white choices but about identifying pathways. However, judging from participant insights, local news, public meetings and in situ observations, such identification is yet to occur.

As matters stand, the dumping of rocks by government institutions is omnipresent. The logical conclusion for private individuals therefore appears to be to protect their property in a similar way and fix the problem as they see fit. Any such approach represents a short-term solution in current conditions and becomes highly questionable in the face of projected climate change. A regional council Project Manager who was also involved in the aforementioned adaptation project by NIWA (Blackett, Smith, et al., 2010) highlighted the following when interviewed in 2012:

We need to look after Coromandel beaches, so why don't we have a long-term plan in place to ensure that in the face of climate change we still have beaches. Why aren't we putting aside money *now* so that in 20 years time when, say, bigger storms come we can actually strategically buy properties and remove them. Why not? That's the sort of thinking we need to get into, I reckon. Why aren't we subsidising back-stop walls? Why aren't we putting them in now while they are not needed so

that when it does happen people aren't dumping all sorts of things on the beach?



Figure 6.16: Beachfront property owners have dumped all kinds of rocks in desperate attempts to decelerate coastal erosion such as here at Cooks Beach (photo by author, 2012).

A lack of authority and institutional responsibility further contribute to why no common adaptation goals are defined in Te-Whanganui-o-Hei/Mercury Bay. The above council Project Manager (2012, pers. comm.) confirms that it “boils down to who has the most power and at the moment the power is not with the community but with those who have quite a lot to lose and are trying to defend it”. By “those who have quite a lot to lose”, the council participant refers to absentee owners who have invested in beachfront property increasingly affected by coastal processes.

The local coastal scientist interviewed (2012, pers. comm.) provided a further crucial insight into politics and power at play when it comes to coastal erosion and why adaptation remains in its larvae-state:

In theory we could say “get your bloody sea walls off our land”, but politically that would never happen in a hundred years. Any one of those guys has more access to political power than half of the rest of the community put together. I took that power on once in an environment court case with a very good environment court judge and a reasonable commission. They dealt to us very harshly. You don’t buy a beachfront property if you are poor, so people have a lot of economic and political power. These people are simply the movers and shakers in our society. Beachfront properties, that’s how it is... erosion reaches their boundary and it gets stopped and environmental regulations go out the window, public interests go out the window.



Figure 6.17: An example of public interests going ‘out the window’: this section of Cooks Beach is experiencing an entire loss of public lateral beach access due to shoreline armouring to protect private beachfront property (photo by author, 2012).

In conclusion, the adaptation process in Te-Whanganui-o-Hei/Mercury Bay does not proceed because the initial framing of the problem and a response has not taken

Puru, reflects the private interests at stake. Political ecology concerns itself with the interactions of the social as well as the ecological within the public discourse. Political ecology's organising question is "how are social relations intertwined with ecological processes"? This question has been brought to the surface by the most frequently used key words.

Other frequently used themes including "not any different", "cannot change", "live with it", and "fix" refer to the actor's position within or as part of the social-ecological conjuncture. It is noteworthy that the close association of these main themes confirm that the term "social-ecological" refers to the concept of humans in nature and that there is no delineation of social and ecological systems (Folke, Hahn, Olsson, & Norberg, 2005). Frequently used themes including "development", "rock walls", and "coastal erosion" document the point made in this chapter that there seems to be little to no agreement or approximation when it comes to climate change adaptation in this area. Furthermore, a sense of denial and a strong belief in techno-fix solutions becomes evident too. The strong care for what has brought people to this area and why it is held so dearly, evident in the word "beach" being referred to most frequently (14%), appear to be "actively muted in order to protect individual identity and sense of empowerment and to maintain culturally produced conceptions of reality" (K. M. Norgaard, 2011, p. 208). What would happen if beachfront property owners would acknowledge that they have put themselves in a position in which, in the long-term, they are not only compromised their own position? What would happen if the same people would admit that the cultural construct of reality may have been flawed; beachfront development was never the cleverest of ideas; and now public and ecological amenities are increasingly squeezed? What would then become of the term "cannot change" with a frequency of 10% and conveying both powerlessness as well helplessness with regard to climate change? A comparison of the most frequently used keywords has revealed that, in comparison with Te Puru, less coherence is discernible, thus underlining a low level of overall agreement resulting in a more messy situation and a comparatively low threshold of concern. The following simple statistical

representation of most frequently used words in the interviews further underlines this point.

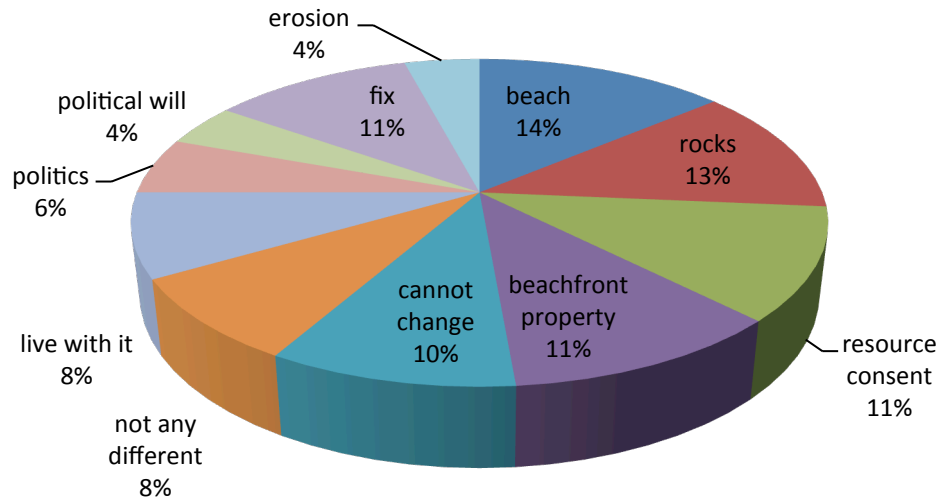


Figure 6.19: Simple statistical representation of word-use frequency from Te-Whanganui-o-Hei/Mercury Bay.

My personal experience is that the issue of private property rights strongly dominate over public interests in this part of the Peninsula. I was never able to discern a “sense of community” in this beautiful bay with a rich history of boat building, kauri milling, flax milling, gold mining, and gum digging. My experience was confirmed by the time I spent in the area in order to conduct interviews. “Whitianga sold its soul,” a local Māori from Harataunga/Kennedy Bay said to me (2012, pers. comm.) when we spoke about the area. This insight is not only also what I personally feel when I am in the area but it also reflects the incoherence or cacophony of voices predominantly focusing on private interests. Indeed, according to Glynn’s (1981) measure of the psychological sense of community, the strongest predictors of a sense of community are (1) expected length of community residency, (2) satisfaction with the community, and (3) the number of neighbours identifiable by first name (McMillan & Chavis, 1986). In highly transitory holiday areas such as Te-Whanganui-o-Hei/Mercury Bay, the psychological sense of community is correspondingly low, which, not surprisingly, results in varied ways and levels of understanding climate change and the necessity to adapt.

The community described in the following chapter, despite being less than 50km from Whitianga, is a different world altogether. Harataunga/Kennedy Bay, also on the Coromandel Peninsula's east coast is a comparatively small, predominantly Māori community with a longstanding history. Everyone knows each other by name in Harataunga/Kennedy Bay and there are hardly any holiday homes or holidaymakers obvious. While just as affected by climate change and the associated challenges, problems are detected and interpreted differently. Culture, as the following chapter discloses, not only leads to certain choices but also to how problems are interpreted and in what way these affect locals.

7

Understanding climate change adaptation: a Harataunga/Kennedy Bay perspective

When we try to pick out anything by itself, we
find it hitched to everything else in the Universe.

—John Muir

The characterisation of climate change adaptation barriers on the basis of the Te Puru community and Te-Whanganui-o-Hei/Mercury Bay has revealed that there is a profound difference in culture and willingness to address the inevitability of projected climate change impacts. Based on the stories of those interviewed, Te Puru appears more willing and prepared to address adaptation barriers. This is primarily due to the community's high level of risk and exposure to natural hazards. Insights from Te Puru have revealed that, arguably, the problem is sufficiently understood in order to overcome the barriers in the Understanding Phase of the adaptation process. The story in Te-Whanganui-o-Hei/Mercury Bay, as the previous chapter has revealed, is different in many ways. The most obvious difference between Te Puru and Te-Whanganui-o-Hei/Mercury Bay lies in the demographic composition that is primarily attributable to the area's natural setting. Those who can afford to own a slice of Te-Whanganui-o-Hei/Mercury 'paradise' and attempt to

be as close as possible to the coast's dynamic zone appear preoccupied with the here and now, which, by implication, involves an absorption in the status quo. As I have explained, questioning this status quo means that an inherent value system is shaken at the very foundations. The result is a 'business as usual' approach where the coast is increasingly armoured and houses continue to be constructed in high-risk locations.

Political ecology has assisted in making sense of how the environmental changes generated by climate change are contingent on politics and power and also how politics and power are contingent on those very changes. The outcome of the initial situation in Te-Whanganui-o-Hei/Mercury Bay is that adaptation remains embryonic and the barriers within the Understanding Phase endure in place.

In this chapter, I use the same approach as in the previous two chapters of describing a community-wide understanding of climate change adaptation based on participant insights and on Moser and Ekstrom's (2010) framework to diagnose barriers to climate change adaptation. Again, I ask the question of how climate change in general and coastal erosion in particular is affecting and will affect the community and how adaptation and erosion are understood and dealt with locally. Insights from this third and final case study community which, once again, is fundamentally different in its geographical setting, demographic composition, and local insights, further confirms how the issue of climate change adaptation is not only deeply contested on an individual level and community level, but also a regional level. Consequentially, a reconciliation and creation of adaptation pathways becomes all the more challenging. Before providing insights into why this is the case, I briefly describe the Harataunga/Kennedy Bay community in the following section.

7.1 Harataunga/Kennedy Bay

Harataunga, renamed by European settlers as Kennedy Bay after the murder of timber merchant John Kennedy in the bay in 1843 (Monin, 2012b) lies on the Coromandel Peninsula's north-eastern part. While I was not able to find out what exactly Harataunga means, the name Harataunga, as local resident and historian John Hovell explained to me, "probably refers to the fact that a *Raukatauri* or *Huarena* chief died on the hills within the watershed of the southern stream of the bay, indicated by the placing of a stick bent at the top and the place becoming known and familiar to the old families of those tribes and acknowledging the bond and connection between them" (Hovell, 2013, pers. comm.). In the same way as I used both the Māori and English name for Te-Whanganui-o-Hei/Mercury Bay, I do the same for Harataunga/Kennedy Bay. Even though the name Harataunga is not commonly used on the Coromandel, this part of the Peninsula remains home to the area's native iwi, which means that using the original name for the area honours the aboriginal owners of this land. Coromandel Town is the nearest town offering supplies and lies about 30 minutes drive on an unsealed, steep and winding road over the Tokatea Range to the southeast on the western side of the peninsula. The two streams, *Harataunga* and *Omoho*, flow from the *Tokatea* Range through the settlement into the bay. There is no road connecting Harataunga/Kennedy Bay with the nearest settlement Whangapoua to the south. This situation contributes to a feeling of remoteness and isolation.

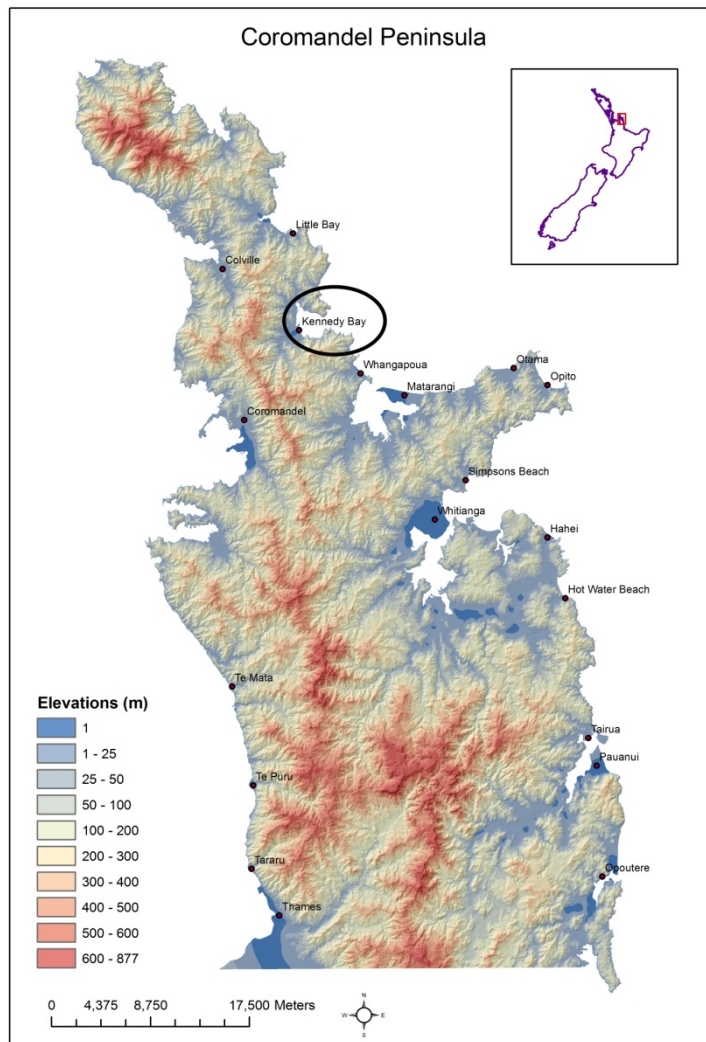


Figure 7.1: Location of Harataunga/Kennedy Bay (map produced with data from the Waikato Regional Council).

According to a count conducted in 2008 by local historian John Hovell (2012, pers. comm.), approximately 120 permanent inhabitants live in Harataunga/Kennedy Bay. Statistics New Zealand does not collect census data for the bay, but according to a local interviewed (2012, pers. comm.), the majority if inhabitants consider themselves Māori. The area has a rich history with the main settlement of the bay commencing in the 1840s when the emerging kauri timber industry attracted young men of the *Ngāti Porou* iwi to the area. *Ngāti Hei*, the dominant iwi of the Whanganui-o-Hei/Mercury Bay area gave Harataunga to *Ngāti Porou* in thanks for

their assistance in tribal warfare⁸¹ against the *Ngāpuhi* iwi (M. King, 1993; Monin, 2012b). *Ngāti Porou* remains the bay's tribal affiliation with seven hapu represented in Harataunga/Kennedy Bay (Hovell & Ngapo, 2008, p. 84). The majority of Harataunga/Kennedy Bay community are of Ngāti Porou descent and the community's only school *Te Kura Kaupapa Māori o Harataunga* is a full immersion school, meaning that it teaches fully in Māori language. The school's philosophy is to keep alive both Māori culture and language in the comparatively traditional setting of the bay. By fostering Māori principles and values, "[being] Māori is taken for granted" (G. H. Smith, 2003, p. 8).

Harataunga/Kennedy Bay was selected as one of the three communities for this research due to representing a Māori stronghold. All locals who have contributed to this research from Harataunga/Kennedy Bay considered themselves either Māori or part-Māori. In many ways, Harataunga/Kennedy Bay represents a counterweight to the otherwise 'western' communities of the Coromandel Peninsula, the 'resort' communities such as those in Te-Whanganui-o-Hei/Mercury Bay in particular.

Judging from the reaction of the majority of locals who wanted to know more about the choice of communities for this research, the majority found the inclusion of Harataunga/Kennedy Bay surprising. Even many locals who have lived on the Coromandel their entire lives appear to know little about Harataunga/Kennedy Bay. In many ways this community has retained seclusion and property developers have to date not managed to gain access to this bay in ways comparable to, say, Te-Whanganui-o-Hei/Mercury Bay. Both Coromandel locals as well as foreign visitors I have spoken to about Harataunga/Kennedy Bay over time, confirm feeling "unwelcome" (longtime resident, 2012, pers. comm.) when entering or passing through the community. There is no village shop or any other form of retail in the community and beach access is neither signposted nor obvious. Even the houses

⁸¹ Tribal warfare reached an unprecedented peak after Europeans introduced firearms to Māori in the early 19th century. Northern iwi including the Ngāpuhi iwi of Northland were among the first to have access to firearms with devastating consequences to other iwi (M. King, 2003). The battles between 1807 and 1842, also known as the *Musket Wars* were characterised by brutality and ruthlessness and resulted in a change of much territorial ownership (Cowan, 1922).

along the road are set back with long driveways and fences to either side. The beach is fenced off and there is only one road access. Most people I have spoken to about Harataunga/Kennedy Bay over the years were not aware that this beach access is privately administered. The owner of the land through which the beach access goes, George Potae, essentially has the power of deciding who to let through and who not, despite claiming to “have no intention of preventing *Kennedy Bay people* from exercising their customary usage of free access to and from the beach” (Hovell & Ngapo, 2008, p. 306, emphasis added).

Notwithstanding an outstanding natural beauty of the beach (not visible from the road) as well as the wider bay, one would not stop or go to the beach in Harataunga/Kennedy Bay unless one had knowledge of it. Figure 7.2 provides an impression of the bay’s scenic beauty and a sense of the tranquillity and unspoilt character of the wider area. The unspoilt foreshore attracts comparatively small numbers of tourists. The only public beach access is unmarked and has no parking space. According to one local interviewed (2013), “non-locals have been attacked and their vehicles have been vandalised by unruly local youths that live nearby ... outsiders quickly learn to avoid the beach”.

Again, similar to the unavailability of census data (as mentioned in the previous chapter), environmental data remained unavailable at the time of writing. Waikato Regional Council, which has kindly provided the LIDaR data used in the forgoing two chapters as well as Figure 7.1, did not have access to LIDaR data for Harataunga/Kennedy Bay at the time of writing.



Figure 7.2: Harataunga/Kennedy Bay looking south with the Coromandel Ranges in the background (photo by author, 2012).

Given Harataunga/Kennedy Bay's comparatively small community size but also the absence of substantial beachfront property investments (cf. Figure 7.2), damaging natural hazards are not of regularly reoccurring character as they are in Whanganui-o-Hei/Mercury Bay or, even more so, in Te Puru. In general, houses are located in less exposed locations. Reasons for this are a combination of factors, which include an obvious rejection of beachfront property development by locals and a culture that does not view beachfront housing as status. Together, these factors can be referred to as politics of landscape in which beachfront property becomes seen as a material good and therefore consumed (P. Walker & Fortmann, 2003). In a consumerist society, beachfront property is linked to affluence, which in turn, is reflected in social status. The question therefore becomes "who owns the landscape?" or a more abstract question "how should landscape and a coastal community look?". Such questions are answered differently by different cultures with different underlying value systems. Consequently, a predominantly Māori community has different understandings and ideas of development than a

predominantly western or Pākehā community. The way the coastal landscape is utilised represents an expressive indicator. Further contributing to the discrepancy in value systems, are “different forms of rural capitalism, class conflict and social control, and cultural frictions” (ibid., p. 469). The following example of the collection of houses by a local longtime resident (2013, pers. comm.) on Harataunga/Kennedy Bay’s beachfront (Figure 7.3) illustrates the point made above:

The beachfront buildings are on locally owned land. These buildings are within the storm surge hazard zoning. This is a response partly in defiance of and in disregard of authoritative regulations – authoritative being the predominantly Pākehā local and regional councils. The main group of recently constructed units right on the front dune beside the beach access road were built by outsiders from the East Coast, making use of a small land share with the intent of selling off the units to the open market. At present the units remain in limbo as Resource Consent was not obtained.

Given the absence of substantial beachfront development in Harataunga/Kennedy Bay, coastal erosion plays a far less significant role than in other areas of the Peninsula where an inherently dynamic environment has been interfered with. This does not mean that coastal erosion is not (already) affecting Harataunga/Kennedy and will increase to do so in the foreseeable future as a result of intensified climate change. To those affected, the loss of land, however, is less financial than it is spiritual and consequently represents an intrinsic value. As such, land itself has intrinsic properties. The issue of coastal erosion is therefore not so much about man-made structures such as beachfront properties but about the loss of land itself. Consequently, “[a]ny consideration of the sea and shore and the land contiguous to it”, as Hovell and Ngapo (2008, p. 32) write about Harataunga/Kennedy Bay, “must take account of the spiritual dimension appropriate to all these people”. The social science researcher interviewed (2012, pers. comm.) clarifies this as follows:

For Māori the connection to the land is forever. They won't abandon completely. The ties will always be there. Land becoming unusable represents a permanent loss. They can't just go "oh well, we'll flick this off and buy somewhere else". The spiritual value is a very good starting point for negotiating environmental debate.

While non-Māori can also inherently identify with and love land, especially when there has been a connection with this land over long time periods, a spiritual connection is not appreciated collectively and therefore it is not part of a cultural value system. The social science researcher interviewed further explains that Pākehā also develop an association if they've been living in a certain area for long enough when they say: "This is *our* beach, this is *our* community – it's *ours* and therefore *we* care for it" (2012, pers. comm.). Such a mindset excludes a 'consumption' approach and any loss of land is likely to be experienced on an emotional level.

For local government, development and the abovementioned 'consumption' approach holds a further dimension. Put simply, development generates rates on which council depends. Consequently, the higher an area is developed, the more rates are paid. Or, as phrased by a longtime resident from Harataunga/Kennedy Bay (2012, pers. comm.), "council needs the money from coastal development, to them the money is in the resource consents and rates and all that stuff". The insurance council executive (2012, pers. comm.) confirmed this situation as follows:

Local authorities are not innocent in this. Local authorities allow consenting because they apply section 72 from the Building Act⁸² which removes their liability and they are able to source revenue from rates. In other words, there is a commercial opportunity for local authorities to do it. ...when local authorities do try and resist this, they often get threats of legal action from developers saying "if you don't allow us

⁸² According to the Building Act 2004 the territorial authority must, in certain cases, grant building consent for building on land subject to natural hazards (Parliamentary Counsel Office, 2004).

we're going to sue you for any loss of investment we already have in the properties".

A further participant (2012, pers. comm.) added that "[n]obody seems to be interested in the big picture... all council does is pass the buck [which is why] we need someone with ultimate responsibility". The big picture, in this case, is that unsustainable coastal development (i.e. marginally above sea level such as coastal communities on the Coromandel), particularly against the background of projected climate change, will incur substantial long-term costs raising questions with regard to cost-benefit (Nicholls & Cazenave, 2010).

A local longtime resident with deep insights into both Māori and Pākehā culture due to his heritage and upbringing further confirmed the point made before with regard to differences in land value and the emanating 'consumption' view of landscape. For this reason, this participant (2012, pers. comm.) highlighted, he aims to protect his land from development in the long term:

Most of our land has been taken⁸³ and we pay these high rates because they keep putting them higher and higher to discourage us, I suppose... We will now have it put into QEII National Trust⁸⁴, hopefully that'll fix them. We are paying double rates all the time: our rates and the Waikato rates⁸⁵.

⁸³ A different longtime resident from Harataunga/Kennedy Bay pointed out the following: We have a right as the indigenous peoples of this country; nobody has the right to take our land off us. Only 2.5% of the land in the Waikato is still in original Maori ownership and 2% of that is in Kennedy Bay. 1902 the Hauraki District Maori put in their first claim against the crown and it still hasn't been settled. How fair is that?

⁸⁴ QEII National Trust helps private landowners in New Zealand to "protect significant natural and cultural features on their land with open space covenants" (QEII National Trust, 2011, para. 1). According to the QEII National Trust (2011), *Open space* refers to "any area of land or body of water that serves to preserve or to facilitate the preservation of any landscape of aesthetic, cultural, recreational, scenic, scientific or social interest or value". The Trust further points out that such covenants help "safeguard forever [both] special features and cultural heritage sites"(ibid., para. 12).

⁸⁵ According to the same local, annual rates are paid to Local Council and further rates go to Regional Council "for practically the same purposes". In the past 18 months this "double-dipping" has led to some stormy public meetings (longtime resident, 2013, pers. comm.).

The local council's recent release of the draft District Plan for public comment identifies an area of intensified coastal erosion at Harataunga/Kennedy Bay's beach projected to increase with sea level rise (Figure 7.3). The identification and management of coastal hazard risk for land use is required under the New Zealand Coastal Policy Statement and the Waikato Regional Policy Statement (TCDC, 2012a). The buildings shown on the map projected to be adversely affected by coastal erosion are comparatively simple houses, much unlike sophisticated beachfront houses at Whanganui-o-Hei/Mercury fetching record sales prices. According to the map produced by the local council, the total number of houses affected is eight. A further longtime resident (2012, pers. comm.) explained the following with regard to these houses:

They aren't allowed to prop them up with rocks or anything unless they get consent from council to do these sort of things. And yet if their houses get washed away ... insurance companies hardly look at it when it comes to buildings on the beach edge. People are now wondering how they could get around it. One of them has gone ahead and put rocks there and everything to stop the big waves from coming in and washing it away.... He had them properly done in concrete but when the waves came in they were undermining his structure. He asked me if I had any idea what to do here. I helped him do it [with rocks] and for now he doesn't get any more trouble. The foundation is steady, they are alright. Someone else wanted to do it and they got into trouble with the council. But at the same time the council now wants to build the sewage for those blocks out into the sea. I don't know what you can do with the people and their houses out on the beach.

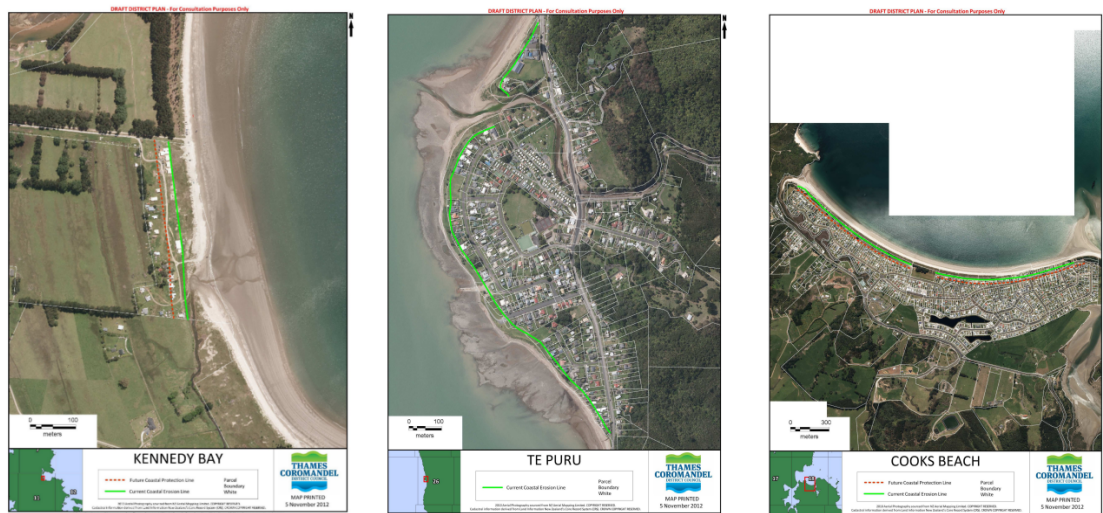


Figure 7.3: Coastal erosion projection for Harataunga/Kennedy Bay by the Thames Coromandel District Council on the left compared with projections for Te Puru (centre) and Cooks Beach on the right (2012).

The aerial photograph from 1982 (Figure 7.4) confirms that Harataunga/Kennedy Bay, in particular the beachfront area has not undergone the same transformation as the majority of other Coromandel coastal communities. Harataunga/Kennedy Bay's comparatively undeveloped coastline is also illustrated in the comparison with the two other case study examples in Figure 7.3.

stages are further subdivided into 16 individual barriers. Each of these barriers can possibly arise within the three stages. Each of these barriers may impede progression to the next stage of the adaptation process. If stages are skipped, there are likely to be adverse adaptation consequences at a later point that can result in maladaptation.

At this point in time, the signal is most clearly conveyed by the policy change adopted in the draft District Plan. The erosion maps illustrated in Figure 7.3 circumstantiate the aforementioned coastal development setback regulations (Focus, 2012; Ramsay et al., 2012). This manifestation of a climate change signal is part of and in line with current national guidance (MFE, 2008c) adopting a sea level rise of 0.9m over the next 100 years.

7.2.1 Barriers in the problem detection stage

Undeniably, the signal of climate change exists and local and regional council are, albeit feebly, sending this signal out in reports and making mention of climate change in public meetings. As previously discussed, the local media remains contained on the issue of climate change. Nonetheless, the existence of a climate change signal, as represented in the first barrier of the Understanding Phase, is available.

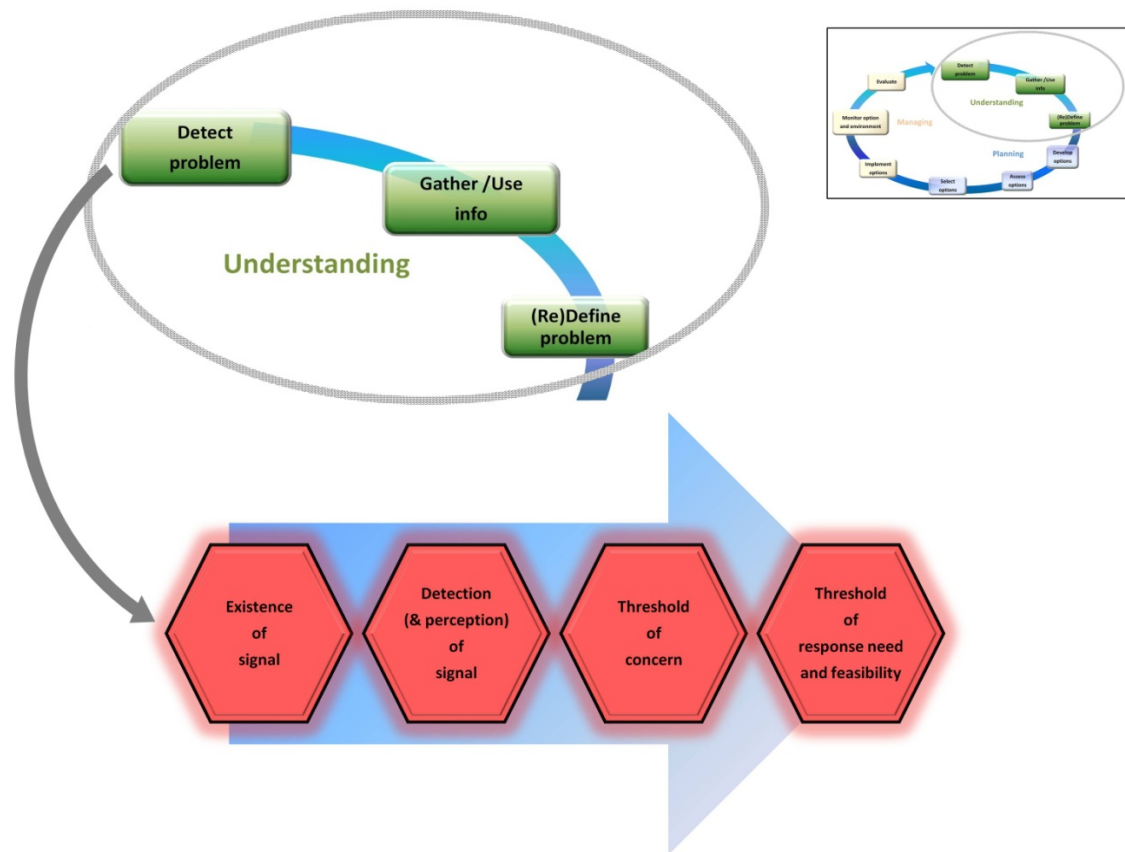


Figure 7.5: Barriers in the problem detection stage.

The following critical threshold to overcome is the detection and perception of the signal by individuals. Therefore, the logical question to ask is whether locals receive, recognise, or perceive and detect a signal? In this context, Ekstrom, et al. (2011, p. 19, emphasis added) highlight the following:

There is a variety of actor-specific reasons why the signal may *not* be received, for example that an actor’s mental model does not allow detection or filters out the signal; the individual is too busy or distracted to notice the signal, the actor is too distant from the signal, to notice it.

In other words, the question is “does the signal reach the actor or not?”. If this is not the case, then why is this so? While it may well be received, this does not necessarily imply that it is believed, taken seriously, or acted upon. The interviews with Harataunga/Kennedy Bay locals have revealed a point of departure different to

the other two communities constituting this case study. Those interviewed are, for the most part, not reached by the signal of climate change. In the cases where the signal appears to reach individuals, the level of concern remains strikingly low. However, as the insights from Harataunga/Kennedy Bay confirm, the concept of lived experience has the strongest implication on how the signal is interpreted and the issue framed.

Moser (2010, p. 467, emphasis added) highlights that climate change must be seen within the “real world context of multiple stressors, on-the-ground vulnerabilities, and the *actual* capacity of communities ... to respond to rapidly unfolding changes...”. Multiple stressors refer to the fact that climate change represents one of many factors requiring attention, both in the physical as well as the social environment. On-the-ground vulnerabilities essentially refers to any extent systems such as the case study communities examined here could be affected by an impact and incorporates the social as well as the physical relationships. Together, the multiple stressors and the on-the-ground vulnerabilities represent the *actual* capacity to respond to and cope with unprecedented changes. Because of the myriad of factors at play, attributing actual physical changes to climate change continues to represent a “major challenge” (Stott et al., 2010, p. 211). Indeed, the locals from Harataunga/Kennedy Bay appear to be captured by a wide range of environmental and social changes that have taken place over the past and are still presently taking place (e.g. loss of land, out-migration, pollution, fish-stock depletion). The result is that climate change gets placed very low on the list of priorities or simply fails to register on the radar, leaving the signal undetected.

In Harataunga/Kennedy Bay, at the top of the priority list of the first-hand accounts of those interviewed are two main environmental changes locals have experienced which continue to impact local lives heavily. These include land acquisitions (Bourassa & Strong, 2002; Coombes, 2003) and fishing grounds depleted by fishing

companies⁸⁶ (Bess, 2001; Memon & Cullen, 1992). Further challenging changes described by participants are rises in rates forcing some locals to subdivide or give up their land as well as wider environmental degradation. The simple fact of being Māori in a capitalist western culture and the associated adversities, as discussed in *Warrior Genes and the disease of being Māori* by G. Raumati Hook (2009), which represents a further major everyday challenge for some interviewed. A longtime resident interviewed (2012) illustrates this as follows:

Even going to the bank to get money for, say, when we wanted to build the house ... if you tell them you've got Māori land they look at you as if you've got some sort of bloody disease. We own a lot of land and my share of all that land is about six beaches. But what's the use if you can't borrow⁸⁷ on it? It is very frustrating.

Indeed, as Taylor and Wetherell (1995) further confirm, Māori face considerable prejudice and intolerance in Pākehā society. The majority of the pressures experienced by locals are imposed on the community from the outside, or, as a local longtime resident (2012, pers. comm.) phrased it “the thing is that thumbs are being screwed by people who are not local”. Indeed, the examples of over-fishing and land acquisitions are external issues beyond the sphere of local influence yet fundamentally affecting the community (Salick & Byg, 2007). Such challenges are keeping locals occupied in a way that they appear to overlay lesser challenges such as climate change. The local kaumatua interviewed (2012) confirms that many of

⁸⁶ A consolidation of quota by larger companies, or “conglomerates” as they are referred to by the local kaumatua (2012, pers. comm.), has led to a reduction in small-scale quota holdings (McCormack, 2010). In line with the insight provided by the kaumatua, the San Francisco based newspaper *The Bay Citizen* (Rust, 2013, para. 32) published a recent article on catch shares. In this article, a local fisherman on the other side of the Pacific Ocean confirms the insight provided by the local kaumatua with regard to catch shares: “I believe local families should have access to local fish stocks. And there's a danger that will never happen again... this system has given it all to the big guys.” Currently, approximately 85% of the fish caught in New Zealand waters is exported, thus not only making fishing one of the largest export markets (Sanchirico & Newell, 2006) but contributing to the observations by those interviewed in Harataunga/Kennedy Bay that there is not much fish left in the area for local communities traditionally reliant on this resource.

⁸⁷ Borrowing money secured over Māori land is difficult due to common multiple ownership. Consequently, cultural reasons become the reason for an impact on land and sales value (McLean, 2002).

the changes that have taken place in the past have had a significant impact on the way locals are able to live their lives. For example, he lists a further example contributing the multiple stressors: “People now need to go to the supermarket to buy [what they need], there are many changes taking place and climate change is a further change”. To date, this change represents less of a challenge than the previous changes Harataunga/Kennedy Bay has experienced. The above point made by the local kaumatua (2012) is confirmed by Walker (1990), who writes of a loss of a traditional socio-economic base. Such a loss is the direct result of an impact on self-support capacity (i.e., having to buy groceries at the supermarket requires income which, in turn, requires an income opportunity). While the geographical isolation of Harataunga/Kennedy Bay enables the maintenance of a distinct Māori identity, involuntary lifestyle changes represent a wedge in the traditionally strong connection of *the people of the land, tangata whenua*, with their land (Houkamau, 2010).

The way the climate change signal is perceived and interpreted, especially in Harataunga/Kennedy Bay must also be seen in governance of and understood within the larger context. None of those interviewed had any good to say about local authorities. According to locals, the previously mentioned institutional stickiness (North, 1990), or the way local government is gridlocked, forms a governance landscape far from conducive for neither a climate change understanding nor any adaptation action. The level of anger and resentment locals demonstrated against government at all levels has resulted in a situation in which communication means and networks are dysfunctional. For example, as one local (2013, pers. comm.) highlighted, some families in Harataunga/Kennedy Bay categorically refuse to communicate with local authorities or pay rates on the grounds that they are Māori and therefore independent of Pākehā regulations. The outcome is that, among others, local authorities cannot communicate the climate change message since they are unable to get through to these community members. The majority of the actual and ongoing anger and resentment those

interviewed spoke about is rooted in the past, as the following insight by a longtime resident (2012, pers. comm.) highlights:

When the Waikato Regional Council was formed as a buffer between local and central government they came down here. We invited them to have a look at the hills and the forests, we pointed out the fresh water we gave them to drink and we said to them “we don’t really need you here”. We told them that we envisage a time when you will impose additional taxes on us for services we simply don’t need. Have a look out there! Tell us we are doing a bad job. Of course they were stunned and shocked but still formed. Now they are not going away [but] nor are we.

The legacy of a dysfunctional governance structure has resulted in a situation where, as highlighted by a local longtime resident (2012, pers. comm.), the majority of locals “don’t trust any of the Government Departments”. Furthermore, the same local unapologetically made clear that “we don’t need them here to tell us how to sustain our land ... council is just a pack of arseholes there to gather revenue for the government”.

Consequently, governance-related barriers stand in the way of problem detection and framing. The resulting challenge is that trust in the source of the signal can be decisive in whether locals dismiss a signal such as climate change or accept and engage with local government. Trust in the messenger, Marx, et al. (2007, cited in Moser & Dilling, 2011, p. 167) point out, “is particularly important in the context of a problem of climate change that is invisible, uncertain, seemingly remote in time and space, scientifically and morally complex, and which may pose significant demands on citizen’s scientific literacy and their behaviours”. An affiliation with a social or cultural group has further implications on who is trusted and how information is accepted and dealt with (Agyeman, Doppelt, Lynn, & Hatic, 2007; Cialdini, 1993). In a situation where conflict and/or distrust dominate, a

communication of the signal by an outsider perceived to be more objective or credible can help (Fessenden-Raden, Fitchen, & Heath, 1987).

The difficult initial situation of problem framing is further amplified by the local media actively blocking transmission by categorically failing to report on climate change, as discussed in the foregoing chapter (cf. Carvalho, 2007). Mass media, O'Neill and Hulme (2009) stress, has a lower signalling strength. In referring to work undertaken by Owens (2000), O'Neill and Hulme (2009, pp. 402-403) explain that a "top-down information deficit model of communication" is "at best insufficient" when it comes to climate change, particularly when the problem-framing, as in this case, is not shared by the public (see also Moser & Dilling, 2011, p. 168ff.).

A further problem as to why the signal is dismissed and not regarded as something to be concerned about, lies in the delivery of the signal (by whom and how). For example, as Ekstrom, et al. (2011) highlight, a direct transmission tends to be not only more convincing but also opens opportunities for dialogue and discussion (Moser, 2006; Podestá et al., 2002). A local longtime resident (2012, pers. comm.) confirmed this by saying that:

It would be better if [council] would come around and talk to people more ... like door knocking, like you are doing. That's the most valuable information you can get and it builds trust. Not everyone turns up to meetings or reads reports. Some people are too shy to turn up, and some people don't have the means to turn up.

The interviews have documented that communication plays a key role in conveying the climate change message. Not only is traditional Māori interaction different to the way Pākehā or 'westerners' communicate, in some cases there may even be a language barrier. The local kaumatua (2012, pers. comm.), for example, pointed out: "I am not much good at speaking English." Successful communication involves "understandings of cultural systems to language [and], at the same time relating language to social organisation, role-relationships, values and beliefs, and other

shared patterns of knowledge and behaviour which are transmitted from generation to generation in the process of socialisation/enculturation” (Saville-Troike, 2008, p. 7).

Complicating matters further, a general disapproval of information and activity coming from local government in particular, means that council has comparatively little leverage in provoking change in thinking. The local value system, which appears to have resulted in a complete rejection of information and action by local government, is based on past experience. In other words, there is a social memory of poor governance. This situation is unlikely to change any time soon unless the issue is addressed by innovative and new means. Consequently, a signal delivery not only by the ‘wrong’ messenger (Pākehā authorities) but also through the ‘wrong’ channels (apart from an absence of community-external social networks through which thoughts and concerns can be discussed, more direct communication channels such as letters or postings on websites are not reaching the target audience) results in failure. Ultimately, the main intention of conveying a message in the first place is to make the message understood.

In Harataunga/Kennedy Bay, the issue of leadership also plays a further significant role in the investigation of the role of the governance and larger context. If the local kaumatua were to place increased climate change adaptation emphasis on his community, the signal would register on a different scale. This could take place either in a bottom-up or top-down approach. If the signal were to be registered more strongly by community members, they would be in a position to exert influence and pressure on the kaumatua who could then demand leadership from authorities. For a similar top-down outcome, a relationship built on trust and understanding between the kaumatua and local authorities would have to be built. Such a relationship would make it possible for the kaumatua to lead his community through the implications and far-reaching consequences of climate change. One way of achieving such an outcome would be through targeted impact scenarios such as increased frequency and magnitude of storm events or sea level rise.

However, this is highly unlikely to happen as long as the kaumatua perceives authorities as external threat to his community, predominantly accentuated by a cultural clash, through land acquisitions and “conglomerates” overfishing the area by “taking what they want and sell[ing] off the fish” (kaumatua, 2012, pers. comm.). According to the kaumatua (ibid.), the issue has “brought not only Māori but also Pākehā fishermen down” and, together with “government [having taken] a lot of our land”, he feels that “what they try to achieve is a power change through land ownership and it happens all around the area and the landowners cannot go against the law”.

Power change through landownership results in both “profound socio-economic and environmental changes” (Gurran, Squires, & Blakely, 2005, p. 11). In coastal areas, when coupled with development, changes of landownership are generally accompanied by “biodiversity loss, water degradation (...), habitat fragmentation and loss, conversion of rural lands, and degraded scenic values” (Gurran, Squires, & Blakely, 2006, p. 2). The majority of coastal communities on the Coromandel Peninsula have experienced all of these factors; the Mercury Bay area discussed in the previous chapter is one such preeminent example. Some elderly community members have described to me what the area was like when they were children, before the remote communities were accessible by vehicle. Mostly these locals, of which there are not many are left, spoke of an overabundance of fish in the ocean and unspoilt lands. For example, one longtime resident from Harataunga/Kennedy Bay told me how, as children, they “would see acres and acres of the sea just pink with snapper schooling; you could take the boat in among them and gaze at them in complete wonder”. Again, such challenges make it difficult to distinguish climate change signals from noise and represent a significant environmental change within a comparatively short time period.

A change of landownership in the coastal communities discussed here was also accompanied by a disrupted transmission of traditional environmental knowledge (TEK). Such a transmission disruption occurred mainly due to the fact that

knowledge resides in individuals (Evers & Wall, 2006). Individuals and the knowledge they hold form indispensable parts of a social memory fabric. Movement of labour has resulted in knowledge loss which has resulted in an inevitable impacted on traditional communities such as Harataunga/Kennedy Bay, as emphasised by a local longtime resident (2012, pers. comm.):

This all happened after the Second World War when the industry started up and [our] people from remote communities moved to the cities. Particularly Māori people moved from these areas to find work in the factories. So the young people have been brought up in the cities, it (the loss of knowledge and connection with the land) is not really their fault. Give any indigenous person a job in a factory and *Coca-Cola* and you destroy the culture.

The local Māori in Harataunga/Kennedy Bay have experienced momentous power changes through landownership first hand. According to local insights, such changes have resulted in many residents feeling helpless. The result has been that a seemingly insurmountable gap between Harataunga/Kennedy Bay residents and (local) government in particular has accrued. An increase in rates, a local historian interviewed clarified, can result in ratepayers being left out of pocket. This situation has become particularly obvious on sought after flat land beside the seashore. The results are that locals either have to subdivide to raise funds or they refuse to pay rates altogether. The Government is then in a position to take the land in lieu of payments after a certain number of years, or, as in the past, a third party can step in and pay the rates deficit and be granted title to the land. This point of departure is best exemplified by the following local's (2012, pers. comm.) assessment of the situation:

There is an underlying control motive by council. I don't mind them controlling their own destinies. But why the hell should they try to control ours? When the rating act was introduced it was responsible for

more confiscations of Māori land than any other act of parliament. When the government surveyed the land and they came to Kennedy Bay of course the Māori knew exactly where their boundaries were. But they insisted and went ahead with surveying anyway. Then they sent out hefty bills and if you couldn't pay they took land to pay for the survey. This was a government initiative imposed on Māori. Māori didn't want it and didn't ask for it. This island here for example was taken for this reason. They took it away and sold it to a Pākehā and gave him 16 years to pay it off. The title changed but no money changed hands for 16 years! I'd rather go to jail than give council a cent! You can fight them and they'll go away but not for long. They come back from a different angle.

A further local provided the following explanation of why matters are the way they are (2012, pers. comm.):

The problem with the rise in coastal property value is that some people are being rated out because rates are assessed on the capital value of the property. So as the value of the property increases, rates inevitably increase. Coastal camping grounds, for example, couldn't afford rates, so they had to subdivide.

The loss of power and land and a myriad of further changes from the outside took place within a comparatively short time period. These include those already discussed as well as a gradual yet extensive deterioration of ecosystems accompanying environmental pollution. Rivers and streams in particular have undergone dramatic transformations through human activities, particularly in gold mining areas as a result of hydraulic sluicing (Harding, Quinn, & Hickey, 2000). Since then, rivers and streams "have been dammed, had water pumped out or diverted, waste discharged into them, and exotic plants and animals introduced" (Waikato Regional Council, 2012a, para. 3). In many places the water catchments have been

cleared for farming, forestry or urban development, which has resulted in nutrients, sediments or wastewater leaching indirectly or being discharged into these waterways. The eutrophication of estuaries (Breitburg, Hondorp, Davias, & Diaz, 2009) is among one of many flow-on effects which in turn contribute to pervasive marine ecological degradation (Halpern et al., 2008; Jackson, 2008; Lotze et al., 2006). The physical destruction of habitat (Jackson et al., 2001), overfishing (Worm et al., 2006), the above mentioned change of land use and the resulting modification, ocean acidification (Fabry, Seibel, Feely, & Orr, 2008) and pollution in the wider sense are all contributing factors to why a detection of often less apparent changes attributable to climate change remain undetected. Indeed, Harataunga/Kennedy Bay's kaumatua identified environmental pollution as one of the main changes he has experienced in his lifetime. Shortly before I conducted the interviews, the containership *Rena* ran aground on the Astrolabe Reef resulting in "New Zealand's worst maritime environmental disaster" (P. Harper et al., 2011, para. 10). The accident happened approximately 50 nautical miles south of Harataunga/Kennedy Bay.

The emergence of a clear signal is further impeded by both the naturally high climate variability discussed in Chapter Two and the slow or creeping change propagated by climate change. Still, some locals, such as the kaumatua's wife (2012, pers. comm.), are experiencing unprecedented weather phenomena such as "huge hail stones" or "vegetables maturing a lot later". In essence, however, an emergence and detection of climate change signals does not take place which means that an adaptation process is not initiated (Ekstrom et al., 2011). One longtime resident (2012) pointed out the following: "I see no evidence of climate change and I don't believe that scientists always get it right". The same local (ibid.) revealed that:

If climate change were to impact on our environment and our source of food, that would be absolutely devastating. And who are polluters again? It's the colonialists! They should be made to clean up their mess!

The emergence of a signal may come in the shape of an extreme event such as the aforementioned 2002 weather bomb or the 2013 drought which both strongly affected the area. These signals, Ekstrom, et al. (2011) highlight, typically lead to media response, either they are amplified or attenuated (Hulme, 2009; Pidgeon, Kasperson, & Slovic, 2003; K. Wilson, 1995). However, and again as pointed out before, local Coromandel media fails to link natural hazard events with climate change, thus impeding the opportunity for local media with a higher signalling strength than mass media to make this connection (cf. S. J. O'Neill & Hulme, 2009). Consequently, the perception becomes that climate change is an issue not so much happening here and now but somewhere else and in the future, and what is more, a problem affecting others. Together, this further contributes to “flawed mental models [further] restrict[ing the] ability to distinguish between effective and ineffective strategies” (Bostrom, Morgan, Fischhoff, & Read, 1994, p. 969).

7.3 Barriers too substantial to be overcome

The questions posed by Ekstrom, et al. (2011) whether there are logical actors to take on the problem and whether there are agreed upon ways of dealing with the problem must, in the context of Harataunga/Kennedy Bay also, be answered in the negative. Ekstrom, et al. (ibid.) further highlight that lack of responsibility, authority, or institutional responsibility may stall the adaptation process, even *if* actors believed in the severity of the problem. In Harataunga/Kennedy Bay, as the insights have shown, the adaptation process does not reach this stage.

The interviews from Harataunga/Kennedy Bay have revealed that the adaptation process is not initiated. The consequence is that the feasibility thresholds are not crossed and that locals do not consider adaptation. Harataunga/Kennedy Bay appears preoccupied with ongoing struggles to such a large extent that these struggles overshadow, for the present, less dominant issues such as climate change. Ongoing struggles are mainly with local and regional government as well as

“[inter]tribal fighting”, as pointed out by a longtime resident (2012, pers. comm.). The same local further highlighted that local Māori “are all at each other - like a whole pack of dogs fighting over a bone... It looks calm but it is actually a hot bed of seething jealousy here” (ibid.). Consequently, a difficulty in transferring and interpreting insights from this predominantly Māori community arises and insights and interpretations must be seen and understood within context. The ongoing struggles are primarily rooted in the past and are accompanied by indigenous experiences, views and understandings. The issue of climate change, however, requires an application of traditional knowledge to present day issues and problems which in itself is challenging (Stevenson, 1996).

Further complicating a detection of the climate change problem is the fact that the level of exposure to coastal or natural hazards within the community is comparatively low. Unlike many of the ‘castles in the sand’ found particularly in the Te-Whanganui-o-Hei/Mercury Bay region, the corpus of Harataunga/Kennedy Bay’s beachfront is unspoilt leaving comparatively few private assets exposed to coastal processes (cf. Figure 7.3). Further, the eight houses currently found on the beachfront and within the erosion zone identified by local council (TCDC, 2012a) are all comparatively modest, inexpensive and simple constructions. Consequently, these structures are less likely to receive the amount of attention (both by property owners as well as authorities) beachfront properties in other parts of the Peninsula are receiving.

The following word cloud (Figure 7.6) illuminates the key issues of importance to those interviewed. Likewise, to the word clouds introduced in the two preceding case study examples, the words or phrases most commonly used are emphasised based on their statistical representation. Here too, the issues locals have spoken about most, visually represent the heart of a climate change adaptation understanding.



Figure 7.6: Visual representation of interview data from Harataunga/Kennedy Bay for the Understanding Phase.

Most noticeably, the key issues accentuated are not so much distinguished by a myriad of voices demonstrated in the previous two case study examples, but by a striking accordance of key issues overshadowing the community and directly linked to Māoridom. These overshadowing issues appear to be holding the community in check and are centred around history, neo- and environmental colonialism, few income opportunities and the environment.

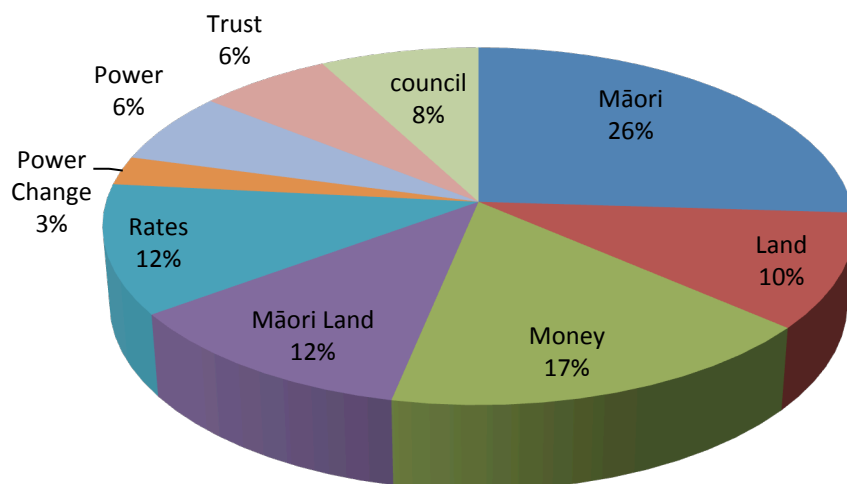


Figure 7.7: Simple statistical representation of word-use frequency from Harataunga/Kennedy Bay.

Supplementary to the word cloud in Figure 7.6, the simplified statistical representation of word frequency in Figure 7.7 further underlines what the Harataunga/Kennedy Bay locals interviewed mostly spoke about. The single most used word of those interviewed is “Māori” (26%), followed by “money” (17%), “rates” (14%) and “Māori land” (11%). The participants have demonstrated that these four key issues are of such overwhelming prominence that they almost mask issues not directly related to these terms. When I coded the interview data, I deliberately left the two terms “Māori” and “Māori land” separate due to the fact that they were used in a disparate context. The term “Māori” was used to speak about the situation of Māori in general and Harataunga/Kennedy Bay in particular, while the term “Māori land” exclusively referred to either acquisitions of land in traditional Māori ownership or the potential of the land (i.e., for borrowing money from the bank). An example is when a local key participant told me about the movement of labour and the resulting impact: “Māori advice and input may have had significance prior to 1950 when the major shift of Māoris to towns occurred,

but now it is less so". The subject matter of a loss of input due to movement of labour is initially not directly related to the subject matter of "Māori land". Both terms "money" at 17% and "rates" at 14% convey the dominant effect of money on activities. In principle, a subject matter is only referred to when it is an issue, which, given the frequent use of "money" and "rates", appears to be the case.

In a nutshell, the interviews have revealed that "being Māori" and living in a Māori community is of high significance. "Being Māori" furthermore brings with it a different connection to the land than that of people with Western backgrounds, not least because Māoridom is traditionally defined through being "people of the land", or *tangata whenua* (Te Ahukaramū, 2012). As I have explained, a connection with the land is first and foremost spiritual (ibid.) and land is not necessarily regarded as a financial asset. The fact that most of the land is no longer in Māori ownership and a further loss of land is imminent if rates cannot be paid has placed finances in a position of paramount importance. This is confirmed by the much-used word "money". The non-Māori approach of regarding land primarily as asset appears to further aggravate this situation. The significance of culture for this community was reflected in the high frequency use of the word "Māori" and a connection between money and culture makes sense. Indeed, money is as much a symbolic referent as it is part of a social system and a material practice, all of which are inherently connected (Gilbert, 2005).

Two further terms of importance to locals and in close connection with the terms "Māori", "money", "Māori land" and "land", are "rates" at 12% and "council" at 8%, followed by "trust" and "power" at 6% accordingly. The frequent use of the term "rates" further reflects the connection with land as mentioned above and the overbearing position of economics, particularly in connection with the land. While the power referred to by locals from Te-Whanganui-o-Hei/Mercury Bay was directly linked to the power held by beachfront property owners and their decision-making powers when it comes to how coastal erosion is dealt with, the term 'power' in Harataunga/Kennedy Bay was used in the context of power struggles tied with land

ownership and the impacts of a change in such power. “Trust”, as I have discussed in the forgoing section, is of further significance to those interviewed. In this case it is the absence of trust or, more accurately, the presence of distrust in not only government but also science that results in the climate change signal being dismissed.

It is striking that, at first glance, none of the above words or terms stands in direct relationship with climate change, adaptation, or coastal erosion. However, these seemingly unrelated issues are the main concerns locals are confronted with and, unlike climate change, these concerns form a major part in local’s lived experience. As such, these issues must be seen as part of climate change since they directly shape community vulnerability. Indeed, the seemingly unrelated issues precisely represent the “real world context of multiple stressors, on-the-ground vulnerabilities, and the actual capacity of communities ... to respond to rapidly unfolding changes in the physical and social environment” (Moser, 2010, p. 467). The question becomes whether climate change could, at some point, metaphorically, become the straw that breaks the camel’s back?

In principle, the changes in the physical and social environment and the according ecological and cultural contexts in which climate change becomes manifest offer unique understandings and insights (Crona, Wutich, Brewis, & Gartin, 2013, p. 2). The understandings and insights from the Harataunga/Kennedy Bay community have revealed that real world challenges, stressors and vulnerabilities mask or overlay a detection of climate change. Fundamentally, the interviews demonstrate that climate change is, so far, neither experienced nor of serious concern. As such, the insights from this community have allowed for an understanding of culture which “frames the way people perceive, understand, experience and respond to key elements of the world which they live in” (Roncoli et al., 2009, p. 87). Despite the fact that climate change and adaptation were the main themes of the interviews and a conscious attempt from my side as interviewer to focus on climate change during the interview process, I found that wider issues and their implications had a

much stronger bearing on community life than in the other two case study communities. Practically, I experienced this chapter's initial quote by naturalist John Muir "When we try to pick out anything by itself, we find it hitched to everything else in the Universe" to be tailored to my experience in the community of Harataunga/Kennedy Bay. I set out to "pick out" climate change and adaptation, yet I found it attached to the rest of the community's universe – a universe apparently dominated by issues the other two case study communities do not seem to be experiencing in the same way.

In defiance of the scepticism I experienced both from without and within Harataunga/Kennedy before setting out to conduct interviews with key community members, the insights I was given by far exceeded what I set out to accomplish. My experiences in this community were like literally stepping into a different world in which other principles or rules of nature are in force. To me, Figure 7.2 in some ways conveys the seclusion of the community amplified by local resident's culture and ethnicity. The hospitality I received by those interviewed by far surpassed my experiences in the other two case study communities. The kindness I was given, I have no doubt, was true and genuine, likewise to the insights those interviewed provided. The issues locals spoke about were 'raw' and 'uncut' and there was never ambiguity in what was said. Also, none of the points were dressed in 'nice' rhetoric and a spade was called a spade. The view by a longtime resident (2012, pers. comm.) that "council is just a pack of arseholes there to gather revenue for the government" confirms the unembellished voices and insights. Again, as in the previous two case study examples, I have let the voices of the community guide the direction of the reality of climate change adaptation and the result I have presented in this chapter.

The question remains in which way, and to what extent, the same government Harataunga/Kennedy Bay residents struggle to come to terms with plan and manage climate change adaptation in place? And what do adaptation policies and associated government activities mean for the 'community' of Harataunga/Kennedy

Bay? Also, in what way does a 'myth of community' (Stacey, 1974) make it even more challenging for local authorities to plan for adaptation?

In the following chapter I will provide an answer to these questions and closely examine climate change adaptation planning and managing as part of the framework to diagnose barriers to climate change adaptation by Moser and Ekstrom (2010). A further question of paramount importance I will provide an answer to is how it is possible to address planning and managing in the absence of understanding. The community of Harataunga/Kennedy Bay in particular has not only confirmed that there remains a long way to go before climate change adaptation is understood and the diverse and contested playing field is acknowledged.

8

Planning and managing climate change adaptation on the Coromandel Peninsula

Two types of choices seem to me to have been crucial in tipping their outcomes towards success or failure: long-term planning, and willingness to reconsider core values⁸⁸. On reflection, we can also recognize the crucial role of these same two choices for the outcomes of our individual lives.

—Jarred Diamond, *Collapse*

In the preceding three case study example chapters, I introduced the individual communities amounting to this case study. To each community I have connected key insights with the framework to diagnose adaptation barriers introduced by Moser and Ekstrom (2010). The insights have not only revealed an immensely diverse and contested adaptation landscape on and within an individual community level but have revealed that there are axiomatic differences between these three communities with regard to understanding the climate change problem, the

⁸⁸ In the context of this thesis, I regard the “core values” Jarred Diamond refers as key aspect of the contestations in need of reconciliation. As it stands, the cultural or individual core values, when it comes to adaptation are not clearly defined or even outlined. Consequently, a reconsideration of core values (i.e., in regard to coastal armouring) implies an understanding and agreement to which safe spaces as part of the adaptive social-ecological governance framework are inevitable.

demarcations of barriers and the subsequent need and pressure to adapt, as confirmed by a local longtime resident (2013, pers. comm.):

It's amazing how distinct our communities are, isn't it?

Each community is as different as the environment in which it is located as well as its community members, all contributing to a unique and individual local setting. In summary, the insights have revealed that Te Puru residents can be described as comparatively aware of a high level of exposure. Subsequently, Te Puru residents possess a comparatively high level of understanding of the need to adapt. Te Whanganui-o-Hei/Mercury Bay residents have displayed 'blindness' to their risk and a strong preoccupation with the status quo. Harataunga/Kennedy Bay, on the other hand, appears to be overshadowed by ostensibly bigger and wider problems rooted both in the past and the present. Such problems appear to stand in the way of an examination, understanding and subsequent knowledge of the climate change dilemma.

In this chapter, I discuss the legislative provisions providing local communities with a capacity to adapt, examine barriers in both the Planning and Management Phases and discuss key cross-cutting barriers within the adaptation process, all of which are generic and intersect all three communities belonging to the Thames-Coromandel District. Further, I present a practical connection between local reality and the adaptive social-ecological governance framework, followed by an exploration of the contested nature of cross-cutting issues. The approach taken enables a comparative review of the three communities and contributes to an identification of practical adaptation steps and measures most likely to lead to meaningful (if not successful) adaptation outcomes⁸⁹.

⁸⁹ While it can be unclear what exactly makes an adaptation process successful or unsuccessful, the input from actors on how they perceive the adaptation process can be vital. Hegger, Lamers, Van Zeijl-Rozema, and Dieperink (2012) use the example of joint knowledge production in regional climate change adaptation projects in defining adaptation success.

This chapter comprises insights from interviews conducted with political and policy leaders in 2013. The political leaders are Labour Party's MP Moana Mackey, and the Green Party's MP Dr Kennedy Graham, while the policy leaders are made up of one representative from regional and local council respectively. Input from the Minister for Trade *and* Climate Change Issues, the National Party's Hon Tim Groser was sought and would have represented a significant contribution. Unfortunately, however, after many fruitless attempts, I was informed by Hon Tim Groser's Executive Assistant that he "regrets to inform me" that he "does not have the *knowledge*" to provide his views on the adaptation dilemma and/or practical ways forward (Fleur Thompson, Executive Assistant, pers. comm., 01.07.2013). The Green Party's climate change spokesperson Dr Kennedy Graham highlighted that the simple fact that the Minister of Climate Change Issues is also Minister of Trade speaks for itself or, in his own words, "because the trade minister is a climate minister he is a trade minister" (Kennedy Graham, 2013, pers. comm.). He continued by elaborating as follows:

This government has decided to shut down any public concern on climate change. We have a government that has gutted the Emissions Trading Scheme and refused to take on a binding second commitment in the Kyoto Protocol and has chalked up one of the highest emissions in the OECD countries⁹⁰ and has allowed the weak settlements to continue indefinitely, in particular agriculture, and thinks that the public doesn't care. It doesn't want to know about the scientific findings.

Indeed, Dr Graham's concerns are reflected in recent governmental moves toward increasing its fossil fuel exporting potential (NZPA, 2011). These include a controversial law change (Crown Minerals [Permitting and Crown Land] Bill)

⁹⁰ Sandvik (2008, p. 333) has found that "the willingness of a nation to contribute to reductions in greenhouse gas emissions decreases with its share in emissions". Despite its comparative smallness, New Zealand had the 5th highest greenhouse gas emissions per person out of 27 OECD countries in 2005 (MFE, 2009b).

“outlawing protests that interfere with or damage oil exploration vessels” (A. Young, 2013, para. 1).

As part of the ‘business as usual’ paradigm, in this case at national (and global) level, key politicians are negotiating fossil fuel contracts with petroleum corporates in an environment where climate scientists delineate ever increasing CO₂ emissions as “seeding irreversible catastrophic effects” (Hanson et al., 2008, p. 1). Labour Party’s climate change spokesperson MP Moana Mackey (2013, cited in A. Young, 2013, para. 11) described the above law change as “a PR stunt that sends a message to the oil companies that this Government is prepared to do anything to get them here - it is prepared to sacrifice any democratic right or environmental standard in order to see this activity go ahead”. According to a news report on Radio New Zealand National following the release of the 5th Assessment Report by the Intergovernmental Panel on Climate Change stating a 95% certainty that human activity is the cause of climate change, Hon Tim Groser endorsed that the Government’s policy on oil and gas exploration will *not* be altered (Radio New Zealand News, 2013). On the local level, this means that pressing adaptation issues are persistently overridden by short-term political and economic interests and issues of power, thus decidedly contributing to the vexatious messiness of the situation.

8.1 Legislation and policy provisions in context

A key point the previous chapters have made clear is that adaptation is contested, divergent, and messy. Amongst others, there is an ostensive inability to agree on adaptation goals and criteria. The myriad of voices is overwhelming and many arguably well-intentioned approaches such as short-term techno-fixes to harden the shoreline resulting in an interference with coastal dynamics represent key contributing factors. I argue that any attempt to force a real world adaptation situation into a delimited framework or approach in which societal aspects are

compartmentalised and compelled to comply is bound to fail. Nonetheless, all three communities examined in this work, underlie the same 'one size fits all' legislative and policy provisions written with the intention of compliance while leaving ample room for interpretation.

Responsibility for the use and management of coastal resources in New Zealand is devolved to local authorities. While the European Commission (2013, question/answer # 3) highlights that "a one-size-fits-all approach to adaptation is clearly not appropriate", the idea behind legislative provisions is to provide the scaffolding of adaptation in the shape of acts policies, plans, guidance and case law outcomes. Notwithstanding, what remains missing are provisions enabling and facilitating local adaptation objectives based on reconciled local aspirations. The question is therefore whether the existing scaffolding stands scrutiny and to what point the existence or presence of a statutory framing is sufficient to prepare for and adapt to anticipated changes triggered by climate change, both biophysical and social. Arguably, however, as long as the political voices at national level, such as those presented here, continue to be disputed, the devolution of climate change adaptation to local authorities, let alone any reflection of local aspirations will remain fragmented and uncoordinated. The following Figure 8.1 provides an overview of the legislative and policy framework bearing on coastal climate change adaptation on the Coromandel Peninsula.

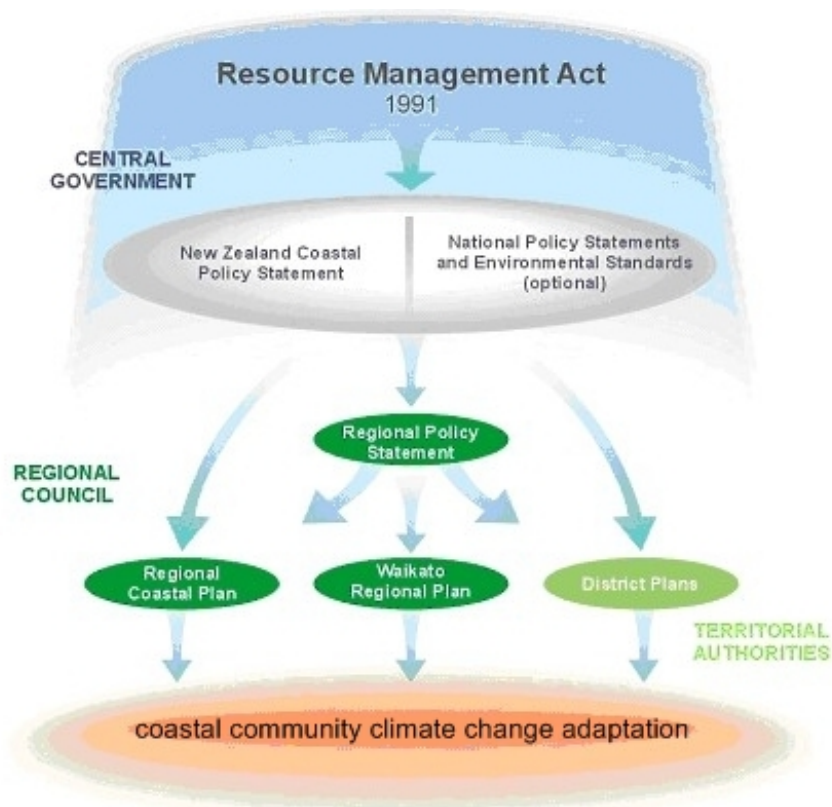


Figure 8.1: Relationship between the various policy and planning documents pertinent to adaptation on the Coromandel Peninsula (based on Waikato Regional Council, 2010).

8.1.1 The Resource Management Act: a national solution?

The Coromandel Peninsula is part of the Waikato Region. This Region is managed by the Waikato Regional Council (regional authority) and the Thames Coromandel District Council (local authority). Five key acts underlie all formal decision-making processes with regard to adaptation. These are the Resource Management Act (RMA, 1991) including the Resource Management Amendment (Energy and Climate Change) Act (2004), the Local Government Act (LGA, 2002), the Building Act (2004), the Civil Defence Emergency Management Act (CDEMA, 2002) and the Health Act (1956).

It would go beyond the scope of this work to discuss each and every provision in detail. Based on the insights provided by the key participants interviewed outside of

the communities (including the Insurance Council executive, local and regional council representatives, the Transport Authority representative, and the spokesperson for the Ministry for the Environment), I will concentrate on the RMA and its instruments relevant to climate change adaptation. These include the New Zealand Coastal Policy Statement (2010); Regional Policy Statements; the Regional Plan; the Waikato Regional Plan; and District Plans. As Figure 8.1 demonstrates, the Resource Management Act (RMA, 1991) sets the tone with regard to policy documents and climate change effects. The New Zealand Coastal Policy Statement (published by the Department of Conservation, NZCPS, 2010) forms a pivotal legislative instrument as part of the RMA. Regional Policy Statements, Regional Plans, and District Plans further devolve legislative adaptation imperatives to the regional and local level. These are complemented by a range of case studies, and planning and adaptation guides.

In essence, a “national solution” or top-down approach to adaptation, such as through the RMA, appears most promising, as the Insurance Council Executive (2012, pers. comm.) indicated. After all, the Insurance Council Executive (ibid.) further revealed, local council is “not innocent” in terms of coastal community vulnerability. To date however, this “national solution” has not prevented local government from “allow[ing] consenting” due to a “commercial opportunity” to “source revenue from rates” (ibid.). Nonetheless, the Insurance Council Executive interviewed (ibid.) further confirms the significance of a “national solution” based on the following view:

Communities have [been] allowed [a] push toward the sea. There has to be some sort of strategy for a retreat from the coast and some sort of un-built area will have to be at the front and that requires people who are already on there to move.... In my view, individuals won't do it.

Fundamentally, a neo-liberal agenda that has set the tone since the 1980s has led to the above “push toward the sea” (ibid.). Glavovic (2013, p. 9) writes that since then there has been:

a strong emphasis on market-led growth, free trade and open markets, devolution, restructuring and downsizing of government, deregulation, privatisation of state-owned industries and more recently the sale of state assets. Government interventions that are construed as potentially inhibiting economic growth or impinging on private property rights are typically strongly resisted.

Political ecology’s fundamental principle of exposing “flaws in dominant approaches to the environment favoured by corporate, state, and international authorities, working to demonstrate the undesirable impacts of policies and market conditions” (Robbins, 2012, p. 99), as noted in Chapter Three, becomes even more relevant in the light of Glavovic’s (2013, p. 9) above statement.

However, the fact remains that New Zealand’s RMA represents the “national solution” to any local government adaptation approach. In particular, Part 2 *Principles and Purpose*: “Promote the sustainable management of natural and physical resources, as well as *other matter* under Part 2 which requires particular regard to the effects of climate change (section 7(i)). Since 2004, the RMA provides for anticipatory planning provisions taking into account the effects of climate change, including sea level rise.

8.1.2 The NZCPS and a National Environmental Standard on sea level rise

The New Zealand Coastal Policy Statement (NZCPS, 2010), a pivotal instrument as part of the RMA with regard to the use and management of the coastal dynamic zone anticipated to be impacted by climate change, provides climate change adaptation direction. Local authorities are required to give effect to the NZCPS 2010

in their plans, policies and selection of methods on how to deal with all coastal issues. The NZCPS remains the only central government response to planning for sea level rise and increasing coastal risk mentioning managed retreat in the context of climate change (Objective 5 and Policy 25). The NZCPS introduces planning horizons of no less than 100 years when assessing the effects of climate change. Particularly against the background of sea level rise, the focus on hazard risks is inevitable. According to Orchard (2011, p. 42), “this may be one aspect of a broadening of risk management strategies away from reliance on engineered approaches to known or expected hazard profiles, and is a relevant consideration for dealing with uncertainty”. Table 1 provides an overview of the aspects of the four key policies particularly relevant to climate change adaptation.

Table 1: Key policies and aspects of the Coastal Policy Statement (2010) with regard to climate change and the management of anticipated impacts.

Key Policy #	Key Aspects
24	Identification of hazard zones and high risk areas over at least 100 years taking into account national guidance and the best available information on the likely effects of climate change.
25	Avoidance of risk, harm, or loss from coastal hazards; encouragement of the location of infrastructure outside the coastal dynamic zone, and discouragement of coastal armouring.
26	The protection of built environments through the protection or restoration of natural features.
27	Risk reduction strategies for protecting significant existing development from coastal hazard risk, including the management of public perceptions and expectations.

A proposed National Environmental Standard on sea level rise would have further provided a base threshold for planning for sea level rise. However, the publication of such a standard has been put on hold until the next Intergovernmental Panel on

Climate Change Working Group I Report (Climate Change 2013: The Physical Science Basis) is published and can be factored in accordingly (MFE, 2013b). The proposed National Environmental Standard would have required the consideration of the consequences of sea level rise, essentially elevating local authorities from assessing sea level rise locally and planning accordingly. Notwithstanding, the proposed National Environmental Standard on sea level rise was already designed to allow for amendments so that updated sea level rise information could be considered (Hunter et al., 2010). As it stands, local and regional authorities continue to depend on guidance publications by the Ministry for the Environment (MFE, 2008d, 2009c) to include into their legislation. Currently, the Ministry for the Environment recommends consideration of the impacts of a 0.8 m rise in sea level by 2090 for coastal planning and development. In summary, the Ministry for the Environment recommends planning for the following projection of future sea level rise (MFE, 2012a, Section 3, para. 3, bold in original):

For planning and decision timeframes out to 2090–2099, a base value sea level rise of **0.5m relative to the 1980–1999** average be used **along with** an assessment of potential consequences from a range of possible higher sea level rise values. At the very least, all assessments should consider the consequences of a mean sea level rise of **at least 0.8m** relative to the 1980–1999 average. For planning and decision timeframes beyond the end of this century an additional allowance of **10mm per year** be used.

“[T]he lack of a national standard”, Renowden (2012, para. 4) writes on his blog site *Hot Topic: Global Warming and the Future of New Zealand*, “means that climate sceptics can waste time and ratepayer money by forcing planning authorities to adjudicate on their minority views”. In essence, what is meant in the above statement is that members of the public rejecting scientific projections can make submissions to local council requesting a disaffirmation of the consideration of sea level rise for development proposals. For example, Barry Brill of Tuscany Properties

Ltd made a submission to the Waikato Regional Council in which he “requests that all references to climate change be deleted as the provisions incorrectly assume that climate change will materially increase the probability of sea level rise, storm damage and weather-related natural hazards in the region” (Waikato Regional Council, 2012c, para. 1). Based on the interview findings and confirmed by the previously mentioned *HorizonPoll* (2012) climate change sceptics, however, do not represent the minority as claimed above by Renowden (2012). This is confirmed by a regional council’s Project Manager (2012, pers. comm.) who, when I asked whether those affected actually understood the adaptation imperative, answered “I doubt it”.

8.1.3 The regional policy statement and the regional coastal plan

On a regional level, the purpose of regional policy statements is to set the framework for regional and district plans. In doing so, regional policy statements must give effects to national policy statements. Furthermore, the regional coastal plan (RCP) has become an obligatory document produced by regional councils.

The key purpose of the regional policy documents is to address issues relating to the regional council’s functions under the RMA. As it stands, the current Waikato Regional Policy Statement (Environment Waikato, 2000)⁹¹ does not make mention of climate change adaptation. However, under Policy 3.5, the preservation of the natural character of the coastal environment in order to ensure its dynamic stability is acknowledged. Coastal erosion is mentioned under Policy 3.8, while Policy 1 highlights the consistent management of natural hazards. Such consistent management inherently includes adaptation to climate change. Arguably, framing

⁹¹ In 2011 the Regional Council made the decision to change its brand name from Environment Waikato to Waikato Regional Council based on the reflection of the regional council’s wide-ranging work *beyond* the environment (cf. Deputy Chief Executive Environment Waikato, 2011). According to the Waikato Times (2011, para. 11) the name change took place without public consultation and is best described as “navel gazing [which] is an indulgence which comes at a time when ratepayers have more pressing concerns”.

the issue around natural hazards avoids a further creation of barriers by virtue of terminology. Indeed, Moser highlights that adaptation language in general “is often not used at all” (Moser, 2014, para. 1)

The Proposed Waikato Regional Policy Statement Decisions (November 2012) ‘Clean’ Version Annotated with Environment Court Appeals (February 2013) (Waikato Regional Council, 2012b, p. 24, emphasis added), mentions the effects of climate change under policy 1.2. It is pointed out that the “effects of climate change *may* impact our ability to provide for our well-being, including health and safety”. The policy further identifies that specific focus should be directed at increased potential for damage from weather related hazards as well as for long-term risks of sea level rise, increased coastal flooding and coastal erosion. Objective 3.5 makes direct reference to climate change adaptation and potential adverse effects of climate change on, amongst others, amenity, the built environment including infrastructure, natural character, and public access. Objective 3.6 highlights the need to manage the coastal environment in an integrated way that unique features and values of the coastal environment are protected and conflicts between users and values are avoided. Objective 3.23 refers to the management of natural hazards in order to increase community resilience and reduce risks from hazards. Policy 6.2 covers planning for development in the coastal environment, and, inter alia, refers to development setbacks and the allowance for the potential effects of sea level rise. Furthermore, policy 6.9 refers to the potential of an implementation of the Coromandel Peninsula Blueprint document, in particular the section on natural hazard reduction. The Coromandel Peninsula Blueprint framework aims at managing future development in the Thames-Coromandel District. However, according to a regional council Project Manager (2012, pers. comm.), the Coromandel Peninsula Blueprint’s effectiveness is contested:

The Coromandel Blueprint was a great opportunity for council and agencies and landowners to get together and look at the long-term. Unfortunately the district council has backed down from following

through with the District Plan. So the Blueprint is not going to have any teeth.

Indeed, while acknowledging the Blueprint report's value for sustainable development, the Thames-Coromandel District Council (TCDC) states its decision not to adopt the blueprint report, "but has instead received the report and will use the Ten Year Plan process and District Plan Review to *consult* the community on issues raised" (TCDC, 2013a, para. 6, emphasis added).

It is further worth noting that policy 6.12 refers to governance collaboration and reveals the importance of consultation between councils, *tāngata whenua*, and the New Zealand Transport Agency (NZTA) with respect to initiatives that could affect the interests of these parties. However, here too it is worth including the words of those interviewed for this research. The NZTA spokesperson for the Coromandel Region (2012, pers. comm.), for example, provides insight into the current state of governance collaboration when speaking of significantly detrimental coastal processes highlighted the following:

We were trying to rebuild a [coastal protection] wall and [due to beach-level fluctuations] that meant that we had to re-design the wall for a greater height which took up a greater footprint, which resulted in taking a bit more beach which the locals didn't like. Now the beach-level has dropped back again following a storm. I don't know whether that's a normal event out there. I have the feeling it is. It's just a natural event. Whether they are getting worse, I wouldn't know. We don't monitor it. The regional council does.

In essence, the NZTA spokesperson not only seems to act against local's wishes but also does not appear to consult with regional and local authorities since he is ignorant of a deterioration of local conditions. The coastal development setback regulations, of which the erosion maps compared in the previous chapter are an integral part, leave no doubt that erosion is increasing and that coastal processes

are adversely affecting development within the coastal dynamic zone (TCDC, 2012a). These maps and reports by the regional council clearly referring to sea level rise projections based on IPCC findings are available on the internet (i.e., WRC, 2012a, 2012b). Furthermore, the NZTA spokesperson “knows” that any change is the result of “natural cycles” (2012, pers. comm.) irrespective of climatic changes. The current state of governance collaboration is further that, for example, the tāngata whenua interviewed continue to feel marginalized and feel that “they (council) don’t come and talk with us”. Policy 13.1 deals with the natural hazard risk management approach, which shall be “integrated and holistic”. The most relevant implementation method for climate change adaptation is to manage new development in order to keep risk within “acceptable levels” and avoid “new intolerable risk”.

A further document at regional authority’s hand for the management and allocation as well as the use of coastal resources is the Regional Coastal Plan (RCP). The purpose of the RCP (Waikato Regional Council, 2005) is to implement the regional policy statement and the NZCPS 2010 by promoting sustainable management⁹². While the RCP (2005) does have sections on the avoidance and mitigation of natural hazards (S 8), including the precautionary approach (S 8.1.2) and the preference of soft over hard erosion protection measures (S 8.1.4), climate change adaptation or the implications of a rising sea level are not mentioned in the document explicitly.

8.2 Policy rubber meets the road of reality

At a local level, district plans, which must give effect to national and regional policy statements, assist local councils to carry out their functions under the RMA. Such

⁹² Section 5 of the RMA (1991) defines sustainable management as “[m]anaging the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well being and for their health and safety while (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonable foreseeable needs of future generations; and (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems and (c) avoiding, remedying, or mitigating any adverse effects on the environment”.

plans must be consistent with regional plans. The district plans refer to resource management issues within the district and further set out policies, rules, and objectives relevant to addressing these issues. While the district plan can be reviewed at any time, it has an official life span of 10 years. The current district plan for the Thames Coromandel District was published in 2010.

The New Zealand Planning Institute (2012) recommends the formulation of explicit policies in district plans addressing the potential impacts from climate change, particularly with regard to coastal flooding hazards. Such policies include the identification of areas expected to increase in vulnerability as a result of climate change. Areas already vulnerable should not be developed or sub-divided, unless effective mitigation of the existing and predicted hazards is warranted. Under Section 2 (Significant Resource Management Issues/Natural Hazards) the Thames Coromandel District Plan (TCDC, 2010b, S. 222.5) recommends the consideration of “potential effects of climate change when assessing natural hazards and associated risks”.

It is fair to say that local council has available a variety of tools to manage the impacts of climate change. Ultimately, local council finds itself at the coal face of adaptation reality (N. E. White, 2012), yet somehow lost without an institutional architecture driving “coherent action at the local level while reflecting community aspirations” (Lawrence et al., 2013, p. 18). Nevertheless, in the past few years a range of reports, maps, and coastal action plans have been produced and both council and community focus/working groups have been established. For example, with the promising aim of a development of a coastal management action plan together with the regional council, local council established a working group in 2012 which includes affected property owners, Ngati Hei, New Zealand artist Michael Smither, and local elected members. The regional council’s Coastal Manager interviewed in 2013 explained the effectiveness of working groups:

We set up a project called Whitianga coastal futures and that was because there was a group of residents who thought they needed groins and rocks etc. so we set up this group, started out with 6 people and in the first 3 meetings they were just telling us how useless we were and how they were right and we were wrong and 'why don't we just get on and do it' and 'I've got a mate with a digger and a truck and rocks and we can do it tomorrow, you useless pricks. And that got completely turned around. We just explained about beach cycles and the systems and the importance of modelling and that the beaches are economic assets and that it's the sand what people want etc and now they are the strongest advocates for it.

Non-statutory tools are at local council's disposal and include guidance publications such as by the Ministry for the Environment (MFE, 2008d) , education such as a free public seminar held in 2011 featuring weather expert Jim Salinger and Lincoln University professor Caroline Saunders (TCDC, 2011), public meetings (NIWA, 2010), consultations, and public and landowner access to information on exposure and sensitivity (TCDC, 2012a). Moreover, development setback regulations (reviewed and refined in 2009) essentially define the minimum space between buildings and the shoreline in order to prevent damage to property primarily from coastal hazards⁹³.

⁹³ Setbacks are divided into primary development setbacks and secondary development setbacks. Primary development setbacks address beach erosion under current conditions whereas secondary setbacks address projected "effects of sea level rise and climate change over the next 100 years" (EW, 2002, p. 3).



Figure 8.2: A policy rhetoric – local reality clash example: A fully consented and insured ‘rebuild’ at Waikawau on the Coromandel’s west coast in 2012 (photo by author).

It is fair to say that the legislative and guidance framework available to local government to address climate change adaptation on the Coromandel is robust. However, the situation remains that local community reality is not reflected in adaptation rhetoric and regulations and rules do not translate into understanding, let alone knowledge, local action, or (albeit contested) community aspirations. Figure 8.2 provides an example of where the new owners who had a “drama” with insurance and they “could have” rebuilt the house “without moving it back” (beachfront property owner, 2012, pers. comm.). The owners “made the choice *not* to fight [council] and go back 700mm and up 400mm” (ibid, 2012)⁹⁴. While, in this

⁹⁴ Even with having moved “back and up”, this house serves as further example of an interference with the dynamic coastal zone, as illustrated by the owner (2012, pers. comm.): “Two weeks after we bought this place a massive big storm came through and washed about 2m of beachfront away.... The existing sea-wall completely broke away.... I would have wanted council to come and tidy it up”. As I have discussed in Chapter One, an interference with coastal processes essentially inhibits natural flexibility (Nordstrom, 2000) and contributes to long-term erosion exacerbated by rising sea levels (Schlacher et al., 2007). Associated costs go beyond a directly measurable financial burden of erosion maintenance but include the loss of land, impacts on public amenity values and an increased coastal squeeze for coastal ecosystems.

case, the prevailing regulations and insurance stipulations made the owners yield to reason, the local coastal scientist interviewed (2012, pers. comm.) denotes that:

You can't hold [people] off with regulation. Ultimately it has to be their understanding. Regulation can create some barriers but ultimately if you only use that route they will complain to the politicians and the regulation will get dealt with or there will be excuses or exceptions found. You would have changed nothing – all you would have done is alienate people.

Contrary to the above insight, the New Zealand Planning Institute (2012, para. 4, emphasis added) highlights that “[t]he effects of climate change *could* be appropriately addressed largely by reviewing current policies, updating the information base to include information on expected climate change impacts, and reassessing the effectiveness of current methods to implement such policies”.



Figure 8.3: Short-term techno-fixes dominate and interfere with coastal dynamics, in this case to protect a road reserve in Whitianga's north (photo by author, 2012).

In principle, despite being robust, the legislative approach to climate change adaptation in New Zealand can be described as top-down guidance with ample room for latitude and interpretation by local authorities. In a way and as it stands, local council finds itself in a legislative 'mix and match' adaptation situation without proper backing by central government. What is more, adaptation is required to fit

neatly into already existing council activities despite, as pointed out in the most recent report by the Club of Rome, the ongoing obsession with short-term solutions such as shown in Figure 8.3 cannot be continued for generations without major change (Randers, 2012).

Ironically however, no key adaptation instruments “explicitly encourage communities to consider long-term dynamic adaptation to evolving coastal hazards, or mention concepts such as transformative change, which may be required as changing risks signal that ‘coping’ will not remain tenable in the future” (Hart, 2011, pp. 12-13). This has prompted the local coastal scientist interviewed (2012, pers. comm.) to advocate for “a change in peoples’ heads”:

You can’t forever make rules!

Nonetheless, coastal communities such as on the Coromandel are predicted to be even more exposed and vulnerable as a result of anticipated climate change (Kirschberg, 2007; MAF, 2010). Legislation will have to grapple with and take into account a future including increased unpredictability, uncertainty and unquantifiability of impacts in the form of storms, coastal erosion, sea level rise, and floods (EW & TCDC, 2003). It seems that in theory and from a policy perspective everything is in place, but the question remains unanswered why decisions are made that are inconsistent with policy and adaptation continues to remain on the backburner of attention. When I interviewed the Mayor Glenn Leach and the Deputy Mayor Peter French (2012) the following climate change adaptation discussion developed:

Peter In the last month I have had ratepayers say to me “Don’t spend any of my money on sea level rise or climate change. It’s a load of rubbish... It’s just a natural progression and it is evolution and it’s just part of a cycle that happens over and over again”. And then there are others saying to me the exact opposite.

Paul So... what's *your* take?

Peter (Hesitates.) Yeah... well, I am not in a position, and none of us in council are really, to make a stand on where we see climate change but we follow the government direction.

Glenn The thing is that we already have so many problems here.

Later in the conversation Mayor Leach added the following pivotal insight:

Glenn I don't think I have ever seen economic values *not* take over.

Mayor Leach's insight above confirms the initial situation of economic growth taking precedent in government decisions, as previously highlighted by Glavovic (2013). This point is further substantiated by the insurance council executive interviewed (2012) who pointed out the economic benefit for local government bred by coastal development.

A key dilemma under current legislation and policy provisions is that local government is very close to the community, meaning that it is inevitably influenced by local power networks and political voices. Further, local government is also caught between the decisions made at regional government level, which again is subordinate to central government. Consequently, local and regional council are in a way forced to do the splits while desperately awaiting tangible and clear leadership from government at central level. Ergo, a coastal 'three wise monkey' situation has arisen: central government 'hears no evil' by claiming to be doing its "fair share" (MFE, 2013a, para. 1) when it comes to climate change, regional government 'sees no evil' by failing to provide clear direction, leaving local government in a situation in which it has little choice but to 'speak no evil' thus resulting in a failure to identify adaptation pathways (Figure 8.4).



Figure 8.4: A coastal three wise monkey situation (photo by James, 2010, artist unknown).

Both the local and the regional policy rhetoric are designed to address resource management issues. Reference to the potential effects from climate change with regard to natural hazards and their associated risks is made, yet a meaningful engagement with the issue remains lukewarm. Further, in the face of risk, uncertainty and change, there is a mismatch between institutional capacities. Given an absence of “politics of climate change” strongly evident in missing multilateral approaches (Giddens, 2009, p. 4), this does not necessarily come as a surprise. Nonetheless, it is unsettling, especially given the fact that emissions are tracking the high end of emission scenarios (G. P. Peters et al., 2013). In simple terms, there is no excuse for inaction. However, while Trenberth (2011, p. 214) highlights that there is no shortage in “solid information on which to base [and review] policy”, the problem is that it remains unknown what to do in order to achieve the “largest effect on the cost-risk distribution” (Rogelj, McCollum, Reisinger, Meinshausen, & Riahi, 2013, p. 79).

A further remaining question is what remaining barriers are and how to proceed with adaptation in order to “significantly” reduce the “residual cost of climate change” (European Environment Agency, 2007, p. 7). In the following section, I provide an answer to the question of how the adaptation Planning and Managing phases (currently associated with insurmountable barriers and consequently out of reach) fare in the context of the Coromandel.

8.3 The climate change adaptation Planning Phase

According to the idealised rational decision-making model, the Understanding Phase (discussed on the basis of the three case study communities in the previous three chapters) is followed by the Planning Phase. So far, the interviews and the local case study realities attest that barriers in the Understanding Phase are insurmountable, leading to adaptation ‘jumping the rails’ before reaching the Planning Phase. Simply, deficiencies and contestations prohibit a progression, but does this mean that adaptation planning or managing are entirely out of reach or absent?

In an ideal world, all barriers in the Understanding Phase are overcome which then allows for the development, assessment and selection of adaptation options within the Planning Phase (cf. Figure 8.5). The finding that the ensuing adaptation Management Phase remains out of reach is in line with findings by Moser and Ekstrom (2010) who base their finding on wider climate change adaptation publications inter alia by Parry, Canziani, Palutikof, Linden and Hanson (2007), as well as Adger, Lorenzoni, and O’Brien (2009), and Dovers (2009).

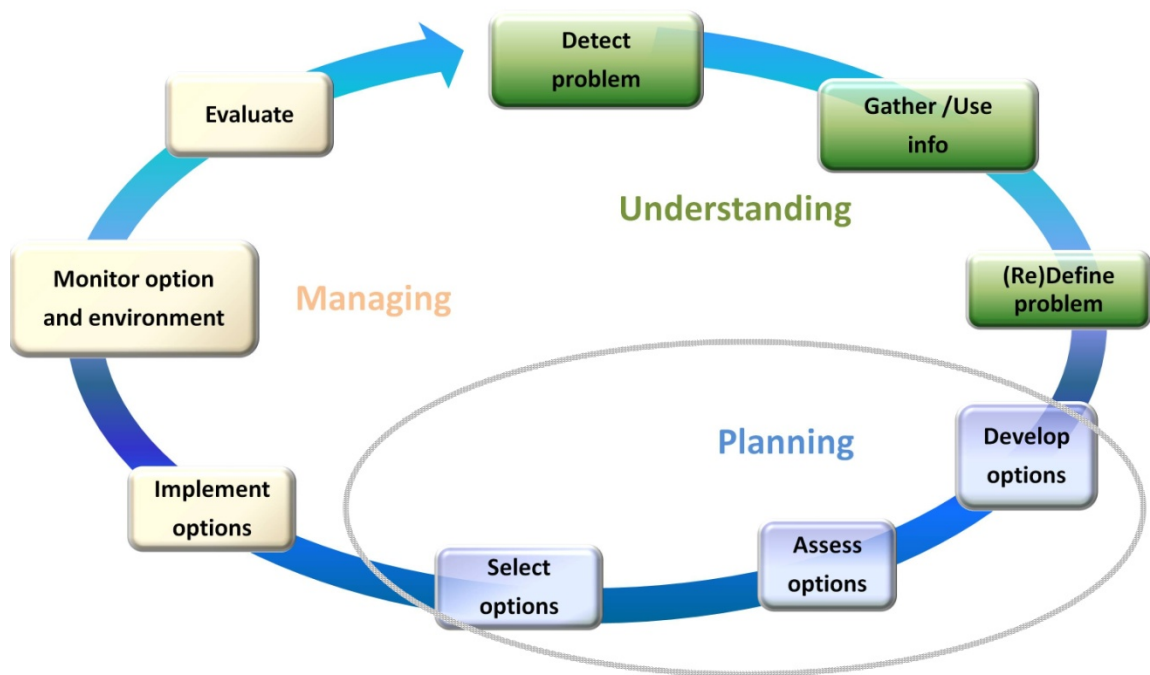


Figure 8.5: Planning, as the second of the three adaptation phases, involves the development of options, the assessment of options, and the selection of option(s) (after Moser & Ekstrom, 2010).

8.3.1 Insurmountable barriers

The option development stage of an idealised adaptation process provides for actors to grapple with possible options to address the problem requiring adaptation. A total of six barriers can stop, stall, or divert the adaptation process, as appears to be the case on the Coromandel Peninsula.

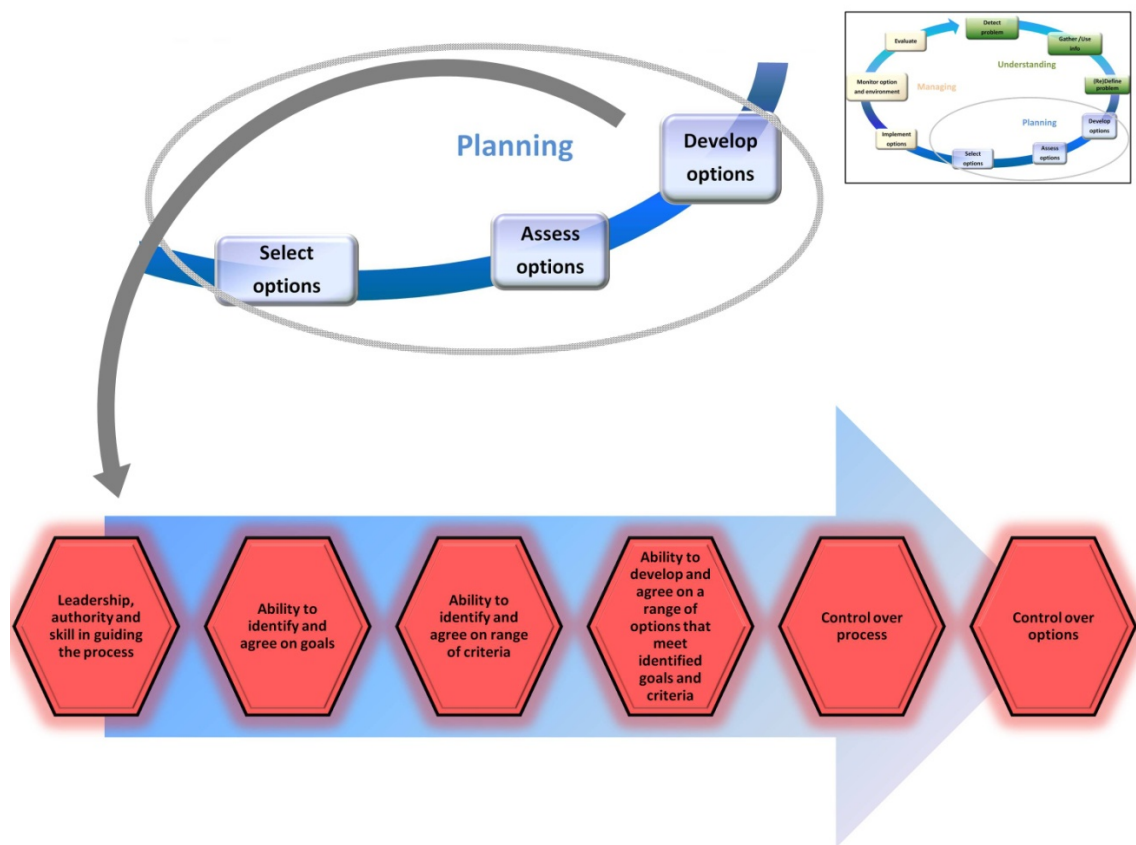


Figure 8.6: Key barriers in the Option Development Phase

The most important part of this first stage in the Planning Phase is for actors to agree on goals. Such an agreement requires leadership, authority and skill in guiding the process beyond basic legal prescriptions to take action. This, Ekstrom, et al. (2011, p. 30) write, is “all the more important ... the more complex and politically contentious the process is and the more actors with different interests are involved”. Confirmed by Manning, et al. (2011), New Zealand does not have a climate change mandate as such and no leader is currently steering the adaptation process. In an ideal process, the leader and the actors would develop and agree on the options. The issue of leadership itself represents a barrier of cross-cutting importance and is discussed in detail later in this chapter.

However, this is inherently difficult where there is a mismatch between the level on which planning takes place and the level where it is implemented. What is more, if goals are not properly defined, the adaptation process is hampered and time and

resources are wasted (Adger, Arnell, et al., 2005b). Basic hazards-based coastal policy goals defined in literature include protection, accommodation and retreat (K. S. Alexander, Ryan, & Measham, 2011; Blackett, Hume, & Dahm, 2010; Few, Brown, & Tompkins, 2007; IPCC, 1990), while relevant legislation as well as New Zealand's adaptation guidance publications (MFE, 2008c; NZCPS, 2010) refer to the goal of a *precautionary approach* with regard to coastal management.

In order to adapt to a multiple increase in erosion coupled with sea level rise and increased magnitude and frequency of extreme weather events, concrete, locally implementable adaptation goals must go beyond the basic and incorporate a long-term understanding of community planning, first and foremost with sustainability as the overarching principle. Put simply, a mere precautionary approach is insufficient. An example of a long-term and sustainable approach is offered by Australia's Department of Climate Change (2009, p. 137), which includes "leasing residential housing that is designed to be dismantled and relocated ... and purchasing land for future protection works where these meet a cost-benefit test".

The overarching issue of coastal erosion affecting all coastal communities yet with different local outcomes serves as good example for currently insurmountable barriers. In essence, the issue is traditionally dealt with either through the previously discussed coastal setback regulations or, more obviously, the shoreline is armoured. On the Coromandel Peninsula, the latter is predominantly done in an ad-hoc approach resulting in maladaptative development. According to a social scientist interviewed (2012), there is a risk that climate change will mean that "[t]he Coromandel will have sea walls all around it and there won't be any sandy beaches [left]". At this point in time, a development of alternatives is severely hampered by fundamental local needs, interests and consequently powerful contestations and contradictions mirrored both in different realities and in different case study localities. Axiomatic adaptation fatigue can further be ascribed to the fact that decisions are still made and things are "still done in the same way as they were in the 60s, 70s and 80s" (social scientist, 2012, pers. comm.). The social scientist

interviewed (ibid.) emphasises that “a lot of the people who are in positions of power now, were actually trained in those days with the dominant ideologies of the time which tend to be ‘yay engineers – go for it’”.

Indeed, Peter Brown from the San Francisco Municipal Transportation Agency who provided insights from adaptation work undertaken in San Francisco at the Climate Adaptation 2013 conference in Sydney (2013) pointed out that “in many cases it is just a matter of waiting for key people to retire before sustainable adaptation strategies can be implemented” (2013, pers. comm.). Kennedy Graham, MP and Green Party spokesperson for climate change, confirms this insight as follows (2013, pers. comm.):

Both (New Zealand’s Minister for climate change affairs Tim Groser and Prime Minister John Key) have a 1980s mentality and they’ll take it to their grave. After all, it has worked well for them and as we all do, we interpret and re-interpret reality according to ideological or philosophical convictions.

As I have demonstrated in the previous three case study chapters, a (re)definition of the actual problem as would be required in the Understanding Phase has not taken place properly which becomes evident in the Planning Phase where options are developed, assessed, and selected (Figure 8.5). Put simply, without a (re) definition of the problem focusing on wider sustainability issues (i.e. on the basis of erosion or flooding), any decision on options becomes futile. Leadership is absent and the goals of the options already in place are not explicit to those in developing the options. A strong local lack of trust in council decisions, particularly against the background of a limited understanding of climate change by those affected is further contributing to a stagnant adaptation process⁹⁵. Actors perceive to have

⁹⁵ Over the years of living on the Coromandel, I have never come across a member of the public who actually had positive things to say about council. Negative anecdotes or ‘mess ups’ by council are not forgotten or easily forgiven by locals. When I spoke with a longtime resident (2012) about local knowledge with regard to high-magnitude events, he told me the following: “We were in the unfortunate position that our county was merged with the Coromandel County Council which then

little to no control over the options developed in the past and, generally, feel that council's "way of consultation is organising a meeting where they tell us what they will do" (longtime resident, 2012, pers. comm.). Without explaining how she proposed for this to take place, a beachfront property owner in Te Puru said to me in 2010 that "[t]he community needs to be more actively involved in decisions made. We should be the ones deciding what is best for us". The local coastal scientist interviewed (2012, pers. comm.) confirmed this perception by those interviewed:

The amount of effort that is put into communication and connection with the community is appalling. I don't think that it is so hard to communicate ... it's just that the whole model of our practice doesn't involve collaborative planning or building networks. Our role as technocrats seems reduced to formulate policy and convince them of it, rather than form debate and discussion and consensus and bring diverse elements together and building common meanings.

The highly complex situation described thus far becomes even more convoluted when the, as yet, seemingly unclear adaptation situation on which there appears to be little agreement and much room for interpretation needs to be managed. Given the local reality in which adaptation planning remains hamstrung, an option assessment and selection (the 2nd and 3rd stages of the Planning Phase) are not further discussed here. In the following section, however, I will briefly discuss the adaptation Managing Phase as part of the diagnostic framework which is followed by a brief discussion of cross-cutting issues.

merged with Thames in 1975. When they left Coromandel they left all the records behind. They would have had a lot of information about this area." Without explaining why anyone would do such a thing, this local further explained to me that he was told "that all their papers were thrown down a mine shaft".

8.4 The climate change adaptation Management Phase

The Management Phase consists of three stages (cf. Moser & Ekstrom, 2010). In the first stage the adaptation option(s) selected (i.e. coastal development setbacks) are implemented. The implementation is followed by monitoring and, lastly, evaluation (Figure 8.7).

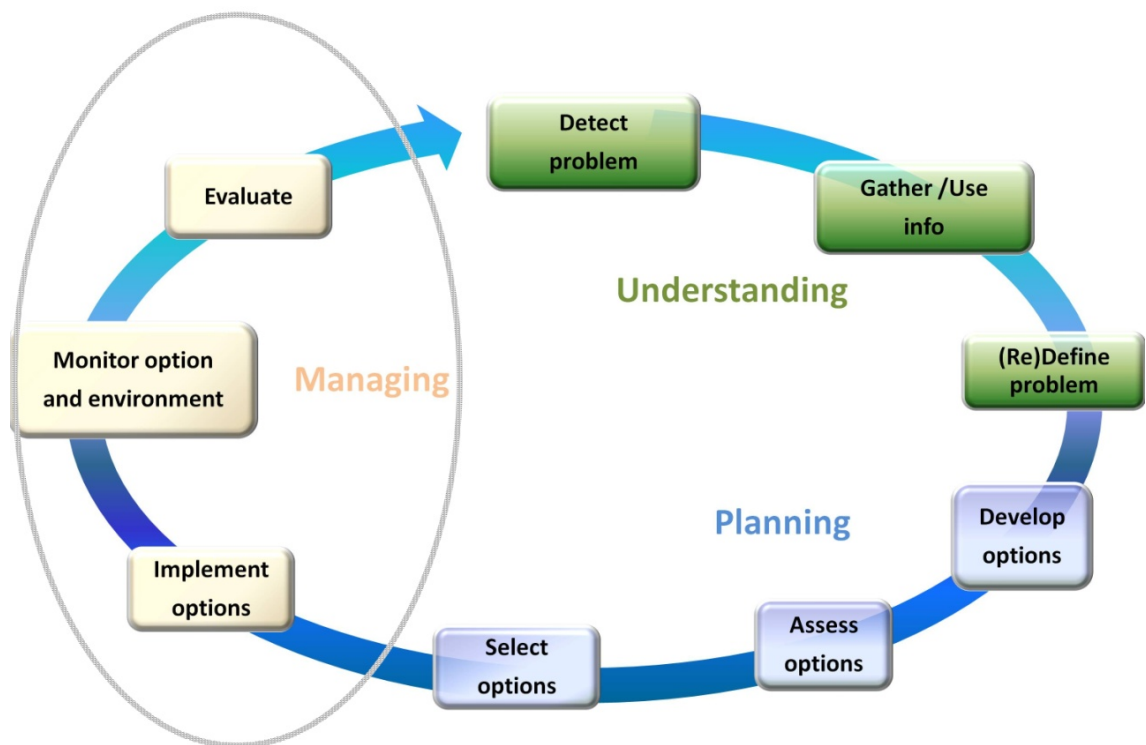


Figure 8.7: Managing, as the third and final of the three adaptation phases, involves the implementation of options, the monitoring of options, and an evaluation (after Moser & Ekstrom, 2010).

As previously pointed out and confirmed by Ekstrom, et al. (2011), only few adaptation processes have actually reached the Management Phase (Adger et al., 2007; Adger, Dessai, et al., 2009; Berkhout et al., 2006; Dovers, 2009; Government Accountability Office (GAO), 2009). Primarily this is due to the significance of the barriers encountered thus far as well as the emergence of climate change adaptation as comparatively new (policy-) issue. For this reason, and given that I

have argued that adaptation on the Coromandel Peninsula already jumps the rails in the Understanding Phase, I will not go into detail of what precisely the Management Phase entails.

However, I will provide an example in order to demonstrate why it is that the Management Phase remains a dream of the future: the coastal development setback regulations or the coastal defences such as shoreline armouring (first introduced in the Te Puru context in Chapter Five) resemble the selection of an adaptation option. Notwithstanding, the resemblance of a selected option implies neither that imminent barriers have been addressed or overcome nor does it imply expedience. In this context, while setback regulations are legal and feasible within the existing framework⁹⁶, the focus of coastal setbacks has been on “delineating the line, rather than on the line as a management tool” (Scouller, 2011, p. i), meaning that development within the coastal dynamic zone is still taking place (i.e. Figure 8.2). Also, engineering techno fixes do little more than obfuscate adaptation and disguise maladaptation and temporary protection comes from coastal defences and flood protection works.

Given that adaptation on the Coromandel Peninsula remains incipient, I will base this discussion of the adaptation Management Phase on a hypothetical, clear and non-debatable adaptation rule or standard as called for by key participants interviewed including the New Zealand Insurance Council Executive as well as representatives from both regional and local council. One regional council representative interviewed (2012, pers. comm.) phrased one such rule or standard

⁹⁶ Under the Resource Management Act (1991), councils have a duty of avoiding, remedying, or mitigating” any adverse effects of activities on the environment. Under Section 106, council has the authority to refuse subdivision consent if the land is considered to be subject to erosion or inundation or where such hazards could be accelerated or worsened as a result of its use. This is underlined by the Building Act (1991). Objective 5 of New Zealand’s Coastal Policy Statement (NZCPS, 2010) is to ensure that coastal hazard risks, taking account of climate change, are managed by (i) locating new development away from areas prone to such risks, (ii) considering responses, including managed retreat, for existing development in this situation, and (iii) protecting and restoring natural defences to coastal hazards. Policy 24 (NZCPS, 2010) requires councils to identify areas potentially affected by coastal hazards. Policies 25, 26, and 27 (NZCPS, 2010) charge council with avoiding the risk of harm from coastal hazards. The most common approach for doing so is through the delineation of coastal setback lines which are discussed in the previous section.

as, for example, “something that says ‘all development must be behind a certain set-back line’ so there is no arguing around it” and that truly encourages and empowers coastal communities to address adaptation. For example, since it has been scientifically established and accepted that the sea level will rise anywhere between 0.18–0.59 metres by the mid-2090s relative to the average sea level over 1980–1999 (IPCC, 2007d) there will also be certain flow-on effects including inundation, coastal erosion, saline intrusion, raised groundwater levels, inundation of wetlands, an altered wave climate and storm surge and a modified sediment supply to the coast, to name but a few (MFE, 2008c). Practically, a non-negotiable rule or standard would take all known and established factors into account and consequently categorically rule out any development within the area known to be adversely affected by rising sea levels.



Figure 8.8: Beachfront development at Matarangi (photo by author, 2013).

The advantage would be that development (such as in Figure 8.8) of which can be established that it is likely to increase vulnerability and result in costs (financial or otherwise) could be principally excluded.

However, the problem remains that adaptation is contradictory, evolving, and ever-changing. In other words, it is questionable that having a water-tight policy in place will promise outcomes. A further factor influencing option implementation is a scale mismatch between those selecting an option and those implementing it. For example, this can be due to a lack of knowledge of local conditions of those selecting the option. “Often things are site-dependant and there are specific solutions you can put in place”, the MFE spokesperson interviewed (2012, pers. comm.) reveals. This in turn raises issues surrounding authority and responsibility. While local council is at the coal face of adaptation reality it has to work within the legislative framework provided by higher authorities, which is why “local government [is] much more interested in having clear regulations in place” (ibid.). However, as the MFE spokesperson further pointed out, it would be more preferable to “have people consider the risk properly and not be hung up on numbers”:

People need to realise that certain consequences are unacceptable and ask the question what can be done as opposed to saying that the regulation says we should plan for [a certain scenario].... This is why our guidance is carefully written to encourage people to think more carefully about the consequences and how they’d cope rather than hiding behind particular numbers.

Ultimately, the situation is that the above impediments need to be addressed in a contradictory environment in which there appears to be no accountability for implementation of an adaptation strategy. This results in tensions between legislative directives addressing an issue of national concern in a consistent manner (e.g. a national environmental standard on sea level rise) versus the imperative to have devolved responsibility and local autonomy in decision-making given divergent local characteristics and devolved democracy. Any way forward, particularly in New Zealand, is muddled by a non-negotiable need for human capital to implement any selected option. Coastal communities are not only confronted with a comparatively

low population density but also the fact that absentee owners can represent the majority. Areas such as Cooks Beach at the southern end of Te-Whanaganui-o-Hei/Mercury Bay are comparatively densely developed but only few people live in the area. According to a local Real Estate representative (2013, pers. comm.), approximately 80% of houses in this area are holiday homes. What is more, the summer population of such areas increases by many more times than what would represent an average occupancy (Beca, 2007). The question therefore arises according to which factor human capital can and should be assessed (i.e. number of permanent residents, number of dwellings, number of rate payers, and number of people over summertime) and also what constitutes a community in the first place (cf. Stacey, 1974).

A threshold of real intent to implement a clear and non-negotiable rule or standard hinges on agreement by all parties. A common example is that those seeking to own coastal property for, say, retirement would likely disagree that an adaptation development standard preventing the sunset years to be spent in a beachfront house is sensible. A common argument, as stressed by a local beachfront property owner interviewed (2012) is that “council needs to protect the coast as well as the buildings -coastal properties *are* the land!” This situation is further complicated by cross-jurisdictional conflicts (cf. Lowe, Foster, & Winkelman, 2009; Moser, 2006) as illustrated by the regional council’s Coastal Manager (2012, pers. comm.):

[Local] council is elected from the community and they are quite close to the community... So it’s hard for them to make what I would consider a long-term decision because it is going to upset the community...

Also, any long-term decision will have to have a close look at the resources required. This refers as much to funding and technology as it does to the required human capital in form of expertise and time allocated. Securing of long-term funding beyond five years, given the decisive electoral cycle, is very difficult.

Ekstrom, et al. (2011) list “funding rules, budget cycles, political turn over, and fickle societal support” as part of the “availability and sustainability of economic resources” to undertake long-term monitoring” as “major obstacle[s] at all levels of governance” (p. 44). Further, there is a risk of any “draconian measures” by council representing a “political bomb” (regional council Hazards and Emergency Management Officer, 2012, pers. comm.). Also, the replacement and ostensible improvement or climate-proofing of systems needs to stand the test of time which must be included into the monitoring regime.

Indeed, as Ekstrom, et al. (2011) bring attention to, environmental changes require monitoring in order to establish whether permanent structures (such as the new bridge at Te Puru but also a private dwelling in the dynamic coastal zone) remain within the ranges of uncertainty and variability the structure was designed for in the first place. With the expected lifespan of private dwellings in New Zealand to be at least 80 years, a crucial question to ask is how and at what point adaptation is deemed a success or failure. Or whether it is even “merely a deviation vis-à-vis previously set goals, targets, or baselines” (Ekstrom et al., 2011, p. 48), as apparent in the already existing “huge gap” between adaptation policy rhetoric and the absence of action on the ground (regional council Coastal Manager, 2013, pers. comm.).

The key message is that not all aspects can be evaluated equally easily or well, the decisive factor being the selected focus (Adger, Arnell, & Tompkins, 2005a; Moser, 2009c; O. R. Young, 1999, cited in Ekstrom, et al., 2011). For example, if the adaptation goal is to prevent harm to beachfront properties from a civil defence focus, the challenge will lie in the evaluation of the reduction in exposure to hazards. One way to achieve this could be through socio-economic impact evaluations, yet these can only address moving targets within limits. Fact is that the sea level will continue to rise which makes the notion of a fixed set back line inherently problematic. The challenge therefore lies in defining thresholds at which point new trajectories of adaptation need to be pursued. Adaptation pathways

consequently must unfold and evolve as climate change unfolds, knowledge grows, institutional structures and processes mature, our social and cultural fabric expands, and impacts become more tangible.

However, if the adaptation goal is to (re)create or protect a functioning dynamic coastal zone for social-ecological reasons and to serve as a buffer for coastal properties behind, the selected focus will be on ecological indicators (i.e. the natural and health part of this ecosystem) and social indicators (i.e. what difference does it make to a coastal community to have a natural coastal buffer versus shoreline armouring?). The difference is that these are cardinally different points of departure which will require different expertise, types of data, and will result in different ways the evaluation is likely to be received by decision-makers and the public.

In the following section, I bring the local messiness of the adaptation situation into the context of the adaptive social-ecological governance framework in order to further strengthen the case for an intersection of political ecology and planning. This is then followed by a section on barriers of cross-cutting importance.

8.5 Local reality and the adaptive social-ecological governance framework

A question stated by Ekstrom, et al. (2011, p. 32) puts into perspective why adaptation barriers cannot and will not be overcome unless there is a fundamental shift in the way it is approached: “Does the goal adequately address the complexity and source of the defined problem and target system?” Another way of defining this question in line with the adaptive social-ecological governance framework is “Does adaptation address the messiness as part of the social-ecological system, the insufficiency of statutory duties and the source of the defined problem (i.e. coastal erosion) and is it sustainable?”

The answer to the above question is a negation. Managed retreat through setback regulations and the supposed distancing from coastal armouring, for example, even exclude each other in principle. Not dissimilar to low-lying Pacific island nations, this is particularly the case against the backdrop of a practically non-negotiable area of settlement as a result of the Coromandel's steepness of the terrain. As it stands, the majority of land suitable for settlement under current conditions is already allocated. Even if coastal communities would succeed in affirming the above question, barriers were overcome, and the options selected were implemented meaningfully, a pertinent question to ask, fundamentally confirming the inherent messiness, is "what would be gained"? If the setback regulations would bring the planned result of a retreat from the coastline, there would still be no place to retreat and if the coastal armouring would bring the protection from the sea as planned, there would be no need to retreat. Consequently, these two options not only exclude each other, if implemented complementarily, they ultimately erode the very reason why these communities exist in the first place, namely to be coastal in an area of scenic beauty. The local council senior planner interviewed (2010, pers. comm.) further elaborated on the underlying local dilemma:

If you are going to diminish the assets that bring people to live in a place you've got to expect your economy and community to suffer. People are simply going to go somewhere else. People aren't going to invest; they are not going to buy property which means that people aren't going to go to the shops which means you are going to see a diminution ... and you end up with a downward spiral ... who's going to pay for that?

The dynamic nature coastal communities on the Coromandel are subject to is one of many further factors contributing to the ever-changing nature of matters. Further accounting for the problem is an overall high level of perceived uncertainty requiring any strategies implemented to be flexible yet robust but also regret-free (Adger, Arnell, et al., 2005b). Fundamentally, this is very difficult to address in current governance structures and in the absence of safe spaces for deliberation, as

the following insight by the spokesperson for the Ministry for the Environment interviewed (2012, pers. comm.) highlights:

Options for retreat have been put out by council but rejected by residents. Now it's come to push and shove and there is no appetite within the broader community to support what is going on. But of course those in the risk zone want to be defended. The community as a whole doesn't want that and council was trying to help but people just kept on developing.

Simply "putting out options", as the above insight demonstrates, does not work⁹⁷. However, both formal accountability as well as political ramifications would have direct implications on the threshold of intent. This must take place within the legislative framework, unless the adaptation strategy would be to change this framework or a process within. In turn, this raises the question of whose interests are represented. Such a question is intrinsically loaded with political issues, which, once again, confirms the pertinence of a synergy of planning and political ecology, especially against the background of power. Any insight into such a decisive point requires knowledge of, and attention to, space and place, land-use practices and human activities, all governed by politics. Interests are spatially manifest in patterns of ownership, rights and, in most cases, a sense of belonging or identification requiring a focus on spatial dynamics.

Currently, adaptation approaches are open to "wide interpretation, with similar risks being treated differently and cases ending up in litigation as a result" (Cameron, 2006, p. 15). The requirement of adaptation being part of current activities has implications on the prioritisation of available resources that determine

⁹⁷ Kahan (2010) alludes to a policy-making communication failure which can only be resolved through cultural recognition in decision-making. Consequently, policy-making must aim to include differences in values and not be based on information alone. The associated risk, however, as Kahan and Braman (2006, p. 169) highlight, is that conflicting values can result in "persistent and bitter opposition". The most promising way to prevent this from happening is to present information in a way that is accepted by culturally diverse groups and to structure debate in a way that "avoids cultural polarisation" (Kahan, 2010, p. 297).

the objective target of what is realistically achievable. It is fair to say that the development of adaptation options is severely hampered from the start and accompanied by a feeling of powerlessness (Aitken, Chapman, & McClure, 2011) and consequently perceived to be a matter for higher authorities (Opatow & Weiss, 2000).

The inevitable question therefore becomes how it is even possible, despite robust legislation, to develop sustainable adaptation options in the absence of available land suitable for settlement, resources, leadership, no clear mandate, as part of ongoing council activities and in a neoliberal environment in which “New Zealanders like their beach houses” (regional council representative, 2012, pers. comm.). The challenge lies in connecting actors with formal and informal governance variables (again, to which power issues are intrinsic) and embed this within the social-ecological system. Ultimately, such an approach makes the creation of safe spaces for deliberation in which issues of power can be explicitly addressed and understood (aided by Political Ecology) possible. Within such safe spaces institutional opportunities can be used to address the fundamentally wicked situations described thus far.

At the moment, however, actors appear to be separated from the governance system, which enables the manifestation of power networks out of reach or comprehension for locals. The result is that not only local authorities but also locals themselves feel powerless and excluded from the decisions shaping their community. What is more, the “target system”, as defined by Ekstrom, et al. (2011), is compartmentalised and regarded and treated as external; there is little appreciation of a social-ecological system in which actors, the governance system and the system of concern are understood and treated as interacting and mutually influencing. The following emphasis in cross-cutting issues further underlines the contested nature and highlights that any attempt to compartmentalise inherently overlying issues as part of a reconciliation of interests by building learning and trust is bound to fail.

8.6 The contested nature of cross-cutting issues

Example is leadership.

—Albert Schweitzer

As much as the differences in the according communities used as case study examples is reflected in contrasting social and geographical conditions, they are also responsible for divergent adaptive capacity. The differences can be ascribed to social community composition which is shaped by and has implications on locals' values, interests, and needs or, more generally, culture, all of which remain addressed insufficiently in the current institutional architecture. These factors are integrally shaped by the priorities set by community members and what is regarded as issues of overarching importance as part of an adaptation process. The interviews have revealed particularly prominent issues with regard to climate change adaptation. All four issues of cross-cutting importance identified by Moser and Ekstrom (2010) were confirmed by those interviewed for this research based on the frequency of key words. The issue of participation has, over and above, emerged as fifth cross-cutting issue. Consequently, the issues of cross-cutting importance reflected in the interview data include (1) leadership; (2) resources; (3) values and beliefs; (4) information and communication; and (5) participation.

However, it is important to understand that it is inherently difficult to ascribe key words to cross-cutting issues. Indeed, the term cross-cutting implies that the issues intersect with a wider set of issues and, as such, cannot be treated in isolation. For example, the 'resources' issue can comprise a range of key words beyond the ones that have been used most frequently by those interviewed. As I highlight in the following section, 'staff' or 'time' for example represent resources too. Or, similarly,

‘Māori’ can be viewed from a cultural angle and therefore fall into the values and beliefs issue, or it can fall into the issue of leadership.

Simply because certain words are absent, it does not mean that they do not matter. For example, participants may have preferred not to speak about the emotional aspect of climate change and adaptation, such as fear, concern or worries because they may have felt culturally inhibited to express such feelings. The following two diagrams demonstrate the difference between a conventional framework disclosing key words and their assignment to cross-cutting issues (Figure 8.9) and an attempt to illustrate the congenital and overarching messiness of the real world (Figure 8.10).

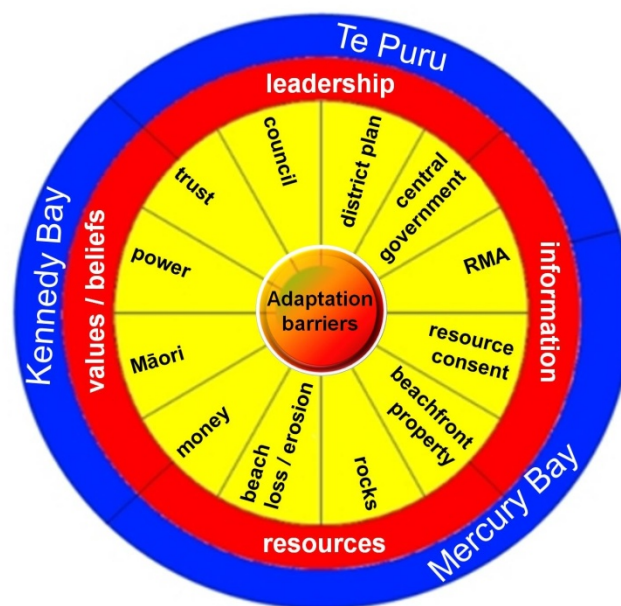


Figure 8.9: Conventional understanding of cross-cutting issues.

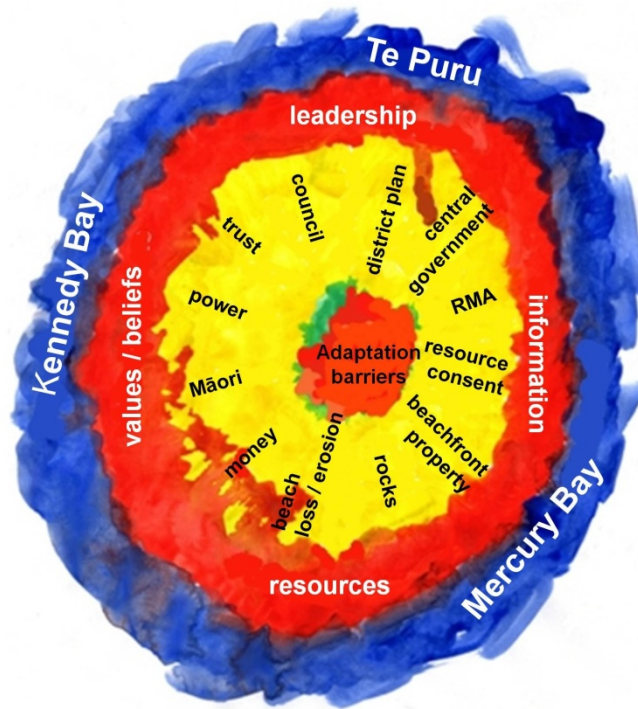


Figure 8.10: The messy and contested adaptive social ecological governance-based adaptation reality.

In essence, the interview data has revealed that actors from Te Puru, on the Coromandel Peninsula’s west coast have demonstrated the highest level of adaptive capacity, while the Harataunga/Kennedy Bay community on the Peninsula’s east coast appear to encounter difficulties detecting the problem in the first place. Those interviewed from Te-Whanganui-o-Hei/Mercury Bay seem to struggle with the fact that ‘business as usual’ is not an option and changes must take place in order to accommodate climate change into decision-making. As it stands, adaptation goals are not envisaged and power struggles inhibit an initial framing of the adaptation dilemma.

Social community composition is complemented by integral differences in the physical settings of the three communities, as documented in the following photographic comparison (Figure 8.11). Te Puru’s relatively high level of physical exposure to potential hazards, arguably responsible for the highest level of adaptive capacity, becomes obvious in this comparison. Essentially, all development is

located on the delta merely a few feet above sea level backed by steep terrain. Te-Whanganui-o-Hei/Mercury Bay is made up of individual communities more or less built on and as near as possible to the area's main attraction, the beaches. Beyond that, the community of Whitianga has sprawled on the delta contributing to an increased risk of flooding. Contrastingly, the sparsely populated Harataunga/Kennedy Bay almost entirely lacks beachfront development and the majority of development is set back from the coast. Furthermore, unlike in Te Puru, no development is located on the stream's outer or eroding bank between the stream course and the ocean. Precisely this area has always been Te Puru's Achilles heel and resulted in previous property loss, as described in Chapter Four.



Figure 8.11: Aerial image comparison of the three case study communities Te Puru (left), Te-Whanganui-o-Hei/Mercury Bay (centre) and Harataunga (right), no specified scale, images oriented north (© Terralink International (NZ) Ltd and Thames Coromandel District Council).

In order to adequately answer the question of what needs to be done to overcome 'business as usual' and what particular issues need to be addressed urgently (as outlined in my objectives, p. 10), it is essential to examine the cross-cutting issues from within the local adaptation context. In the following subsections, I examine five reoccurring barriers of cross-cutting importance in order to clear the way for the conclusion in the following chapter.

8.6.1 Leadership

Leadership is indispensable to the adaptation process. A good leader may be able to compensate or outperform shortcomings in other cross-cutting issues (for example resources). As such, a good leader “represents a huge resource and not just [someone] trying to tell local communities what to do...” (Labour Party’s climate change spokesperson Moana Mackey, 2013, pers. comm.).

In the absence of a clear adaptation mandate, law or job description, adaptation can hitherto be ignored since there is no formal requirement to ‘get the ball rolling’. While two of the three most frequently used key terms associated with leadership are council and central government, this function, particularly within the Coromandel context in which local Māori are an elementary part of the social fabric, can and even must be taken on by individuals. Indeed, as the insights from Harataunga/Kennedy Bay have revealed, adaptation leadership for Māori is first and foremost expected to come from within Māori culture. The regional council Project Manager interviewed (2012) highlighted that “councils have a responsibility to lead and show leadership and that should also draw on the learning of iwi over time”. When I asked the Green Party’s climate change spokesperson Dr Graham (2013, pers. comm.) how coastal climate change adaptation could be advanced and strengthened, he confirmed that:

It all comes down to leadership at the local level and that’s just not there. And it’s certainly not there at the national level with climate change minister Groser and John Key (Prime Minister). The insurance industry is [also] a game changer. It will be interesting to see how many wealthy Aucklanders are going to buy in an exposed position that is not insurable. I don’t think they’ll do that. I wouldn’t.

The above insight is mirrored by the regional council’s Coastal Manager (2013, pers. comm.) who provided the following insight into leadership:

One of the main barriers is that there is no crisis. A lot of the decision-makers are politicians. And they respond to *fires*. It could be a political fire of one form or the other. But it's only political fires that they are most responsive to. So an environmental crisis gets no attention – often until it's too late because environmental situations – and coastal erosion and climate change are really good examples – don't present themselves as a crisis. It's a slow cumulative degradation that raises no flags. Nobody really joins the dots and if you do, well, there's not a fire today so we can put it off. So it always becomes a secondary thing. When a few houses start falling into the sea, it's really too late. That only leaves one response and that's to put rocks in place⁹⁸. And that's why things don't get done because we haven't got a crisis. It's just not on the political radar. The crisis at the moment, and will be for a long time, is keeping rates down. That's the crisis. It comes at the cost of continued environmental degradation. But that's not seen as crisis because it is what was yesterday and the day before or even a decade before.

Arguably, a valid dispute would be that adaptation to climate change is fundamental to “keeping rates down” (ibid.). Furthermore, the climate change crisis in general and adaptation in particular exceed ongoing environmental degradation which is why a different approach including different language could be promising (Moser, 2014; Moser & Dilling, 2011; Nerlich, Koteyko, & Brown, 2010). Framing the climate change dilemma around risk in the face of change and focusing on coastal erosion would still make adaptation essential while taking away the ‘heat’ from the climate change debate and the fact that it can be perceived as overwhelming. This point is highlighted by a local council's spokesperson (2013, pers. comm.), who further illustrated the situation local council finds itself in with regard to climate change:

⁹⁸ Putting “rocks in place” refers to ‘rip-rap’ shoreline armouring (cf. Figure 1.7 and Figure 5.7).

[Y]ou've got folk in leadership positions for whom climate change is simply too big and overwhelming, particularly when you have to deal with those down the road and you are tasked with fixing their pot-holes, their sewage system or what have you. So you've got the immediacy of day-to-day council work but it takes a lot to see what the big wider issues are.

The adaptation process will require a willingness to learn from decisions made so far but also what the future may bring, which in turn requires substantial political courage. As it stands, this is not given due to the way the current political system is set up which is why "in their current three year terms they are not so keen to do that" (regional council Project Manager, 2012, pers. comm.). When I interviewed the Green Party's climate change spokesperson Dr Kennedy Graham (2013), he further emphasised that:

It needs political leadership by Mayors. Why don't the Mayors get together and form 'New Zealand Mayors for climate change protection'? It all comes down to leadership at the local level and it's just not there.

The Green Party's climate change spokesperson Dr Kennedy Graham's above insight is contrasted by the current Thames Coromandel Mayor Glen Leach (2012, pers. comm.):

If there is a problem we can only take leadership from what comes out of central government. We're aware of it (climate change), and take it into account with respect to the review of the district plan. But in reality I personally have not seen anything that tells me that it's happening.

In the absence of a formal climate change adaptation mandate on the Coromandel, social learning is a factor that becomes crucial. Essentially, by observing and copying, the public can learn that, say, refraining from developing an area

potentially exposed to flood hazards will avoid potentially difficult situations at a later stage. Work undertaken by Pelling, High, Dearing, and Smith (2008) examines the relationship between individual and social learning and identifies ways through which social learning can contribute to proactive climate change adaptation. The key lies in the realisation of the potential of surpassing formal processes within policy and organisational settings which can best be achieved through experimenting, imitating, communicating, learning and reflecting on their actions. By amalgamating social learning with institutional theory, which essentially examines the ways institutional structures guide social behaviour (Scott, 2005), the authors identify two key pathways for adaptation: institutional modification and reflexive adaptation. Together, these translate into higher resilience, adaptive capacity and sustainability (Pahl-Wostl, 2009, cited in Ekstrom, et al., 2011, p. 47). In the context of adaptation, the term reflexive essentially refers to the notion of self-correction after an impact. Just like a physical reflex, reflexive adaptation involves the automatic reaction to an external stressor (Glavovic & Kelly, 2013).

8.6.2 Resources

While resources can be financial, technical, or technological, they can also refer to staff expertise and time. The legislative framework plays a decisive role when it comes to the allocation of resources. In essence, as I have demonstrated, the legislative framework determines priorities, according to which resources will be allocated. As it stands, adaptation is required to take part of already existing council activities, which results in limited resources allocated to the dilemma. Both the RMA and the district plan are among the most frequently used key word by those interviewed, but also money, costs and rates, which, together, translate into a strategy, as Labour Party's climate change spokesperson Moana Mackey (2013, pers. comm.) explained:

What is very much missing is a proper climate change strategy. Certainly at local government level it is very ad hoc. Some councils are doing things, but most are doing nothing. It's all seen as a central government issue when it is not.... But at the moment there is really no desire to do anything about climate change because it is not seen as a priority. We have a government that is *very very* hostile to doing anything about climate change. So they have no desire to work with local government.... Government has no desire to educate people and inform them on how serious things actually are. We're basically in free fall. We need leadership from central government and concerted action from central government to work with local government and with local communities. It must be an all-of-government approach which will require leadership. Local government must be a resource and partner but current government dictates to local government. It has taken away the four well-beings⁹⁹. From their perspective local government is about rubbish, rates and roads. But it should be about community empowerment.

While climate change is not seen as a priority attracting resources, as Moana Mackey correctly points out, coastal erosion and tightened regulations regarding the issue of building consents as well as obtaining insurance cover for properties at risk represent issues of comparatively high priority. Again, this strengthens the argument made above of using a different approach. Further, this has implications on the identification of locally implementable adaptation pathways.

8.6.3 Values and Beliefs

The interviews have revealed that values and beliefs are the most pronounced issue of cross-cutting importance. As I have discussed in chapter three, culture and

⁹⁹ The focus on sustainability as part of the Local Government Act (LGA, 2002) includes social, economic, environmental, and cultural well-beings.

cultural influence play a significant role. After all, this overarching importance of culture as the social norms, values and attitudes and its influence on locals' beliefs about society and the environment (cf. Pellow, 2003) has led to political ecology forming one of the two building blocks of this work. Swidler (1986) emphasises that culture as such goes beyond merely providing values based on interests but is made up of "chunks of culture" (p. 283) which in turn translate into "strategies of action" (p. 273) based on "symbols, stories, rituals and world views which people may use in varying configurations to solve different kinds of problems" (p. 273). The three case study examples have revealed how fundamentally messy the local adaptation situation is, most of which can be distilled to underlying values and beliefs. The cultural factors influence the decision-making processes seminaly (Renn, 2008), and can work as both barrier and as driver to adaptation, for example simply talking about adaptation, as Labour Party's climate change spokesperson Moana Mackey (2013, pers. comm.) pointed out:

There has been a reluctance to talk about adaptation because of the fear that it would take the focus away from mitigation. Even government doesn't really want to talk about adaptation because it is almost like admitting failure. But the reality is that we are already committed to a 2°C temperature increase. But the conversation with the general public hasn't even gone far enough to explain this increase. I don't think the public understands that.

The result is not only a confusion of people's values and belief system but a more general knowledge-action contradiction pervading all aspects of climate change. The insights from those interviewed have revealed a point confirmed by a local council's spokesperson (2013, pers. comm.) that "people don't seem to get their head around what climate change means. They don't understand the dynamic, they don't understand what climate change is".

8.6.4 Information and Communication

Adaptation information essentially describes the creation of information (who produces the information and whose needs does this information meet), the way it is communicated (top down and one way or as part of a dialogue contributing to knowledge and understanding), and how and by whom it is received (letters, flyers, public meetings or face-to-face consultations). In substance, information translates into knowledge. Hence, knowledge or “knowing” or “not knowing” itself becomes a “political act” (K. M. Norgaard, 2011, p. 70). For example does “not knowing” about the detrimental side effects of an interference with dynamic coastal processes, particularly against the background of rising sea levels, alleviate beachfront property owners from responsibility for public amenity values? “Not knowing” can further “shut down any public concern on climate change” (Green Party’s climate change spokesperson Dr Kennedy Graham, 2013, pers. comm.). Consequently, information that is mis- or not properly understood or even a complete lack of information have significant impact on the adaptation process.

Kahan (2010) describes the decisiveness of cultural values influencing what or whom we believe while Maibach, Roser-Renouf, and Leiserowitz (2008) specify the importance of information being shaped to a specific audience. At the end of the day, however, any information and communication will have to address what locals want for *their* community; how *they* want the place they call home to be in the future. This is different for each community. For example, adaptation information for Harataunga/Kennedy Bay will have to be different to information intended for absentee beachfront property owners in Te-Whanganui-o-Hei/Mercury Bay. The reason for this is the need for considering “pre-existing beliefs, values, cognitive biases of the recipients as well as credibility, salience, transparency, and historical relationships between messenger and recipient, among other factors that may prevent the target audience from receiving the information and/or intended message” (Cash et al., 2006; Cash et al., 2003; cited in Ekstrom et al., 2011, p. 50).

The regional council's Coastal Manager (2013, pers. comm.) highlighted the need for information to include a vision of the future in general:

Hand in hand with no leadership there is no vision of the future. There is no vision of the preferred future we want to create. People don't have that. To have a picture of the vision we want to move towards is almost seen as a luxury. The vision we have for ourselves is immediately now. It's never something we want to go forward. The visioning part is the policies and plans and strategies. They paint a regulatory future but [what we need is] the vision for a better way of living, like a new vision of the foreshore ... a social vision, a community, aesthetic, amenity and all the well-beings vision. That's not painted for everybody. And so nobody has a common thing to buy into. We all have our own vision but there is no common one.

Ultimately, planning for the future will have to include vulnerability information incorporating risks from climate variability as well as non-climate stressors as well as information on wider hazards (Ekstrom et al., 2011).

8.6.5 Participation

Those interviewed failed to explicitly refer to participation as a key barrier of cross cutting importance on the Coromandel Peninsula. Interestingly, however, a total of eleven participants (including *all* locals from Harataunga/Kennedy Bay) mentioned that they do not feel included into local decision-making processes and that their local knowledge is not valued by local government. One key insight that particularly struck me was by an elderly local farmer whose forebears were among the first Europeans to have settled on the Peninsula. This farmer (2012, pers. comm.) is not only witnessing unprecedented changes in the coastal area where he lives (Figure 8.12) but also claimed that:

Council doesn't come and talk with the locals; they don't do it, honestly. I don't know. You'd think they would have come and spoken with us and ask about local issues. But no, they don't. They act like they know everything. I just don't understand them.

As previously mentioned, there is no 'one-size fits all' when it comes to climate change adaptation, even less so when it comes to deciding not only who should participate at what stage, but also in what ways (Moser, 2007; Pettenger, 2013; Stringer et al., 2006). Different regions/communities and different stages of the adaptation process will require different key actors to participate. Despite Walters, Korman, Stevens, and Gold's (2000, cited in Ekstrom, et al., 2011) indication that an early adaptation process may not necessarily include local community members and consist entirely of managers and scientists, there is much value and potential in collaborative problem formulation and process design which is related to actually living in a coastal community. Arguably, this can only be achieved by including those most affected at every stage.



Figure 8.12: Recent changes in the coastal zone result in the roots of old Pōhutukawas (*Metrosideros excelsa*) becoming increasingly exposed and slowly dying such as here at the northern tip of the Coromandel Peninsula (photo taken by author, 2013).

After all, a desirable outcome is a connection between science and practice in which science supports and knowledge and understanding is co-produced, as highlighted by the regional council Coastal Manager interviewed (2013, pers. comm.):

For over 10 years we've been trying to get a better result for the beaches, in particular Buffalo Beach (Whitianga). But we've been battling against entrenched mind sets ... and against engineering paradigms between hard and soft coastal structures and we've been battling against politicians who see no issue. So it's taken 10 years to move things to where they are actually happening for the better now. Part of that was visioning. So we had before and after visualisations of the beach with the actual homes in place. So people could see "oh, that's my house". And then we've had the new coastal policy statement (NZCPS, 2010) come along which was a bit more robust around what

you can and what you can't do. So these things slowly came together...
(Coastal Manager, 2013).

Since the form of participation must be forged to what the intended outcome is to be, two immensely challenging questions stand out, namely who should participate in the process and, possibly to a greater extent, who decides who should participate, which brings the topic back to leadership. After all, if the participatory process is done badly, this in itself could represent an additional barrier and set the adaptation process back considerably. Nonetheless, the benefits of participation counteract the potential impediments whereas the key appears to lie in empowering stakeholders in the adaptation process as opposed to informing them what to worry about. In essence, as the social science researcher working on adaptation interviewed (2012, pers. comm.) highlighted, “debates need to be managed and stepped up, broken into processes with each party coming to understand each other and attempting to find some kind of path through”. At this point in time however, the reality is that “the point in participating” is challenged because “you can just jump this whole process and go to the environment court” (ibid.). The bottom line, however, is that a successful creation of a “public adaptation good” “entirely depends” on the participation and action of “individual private actors” (E. L. Tompkins & Eakin, 2012, p. 6).

In this chapter, I have substantiated the reasons behind why neither the Planning nor the Management Phases are reached by the three case study communities underlying this research, despite a consideration of the effects of climate change being required by statute. I have based the according stages on a comprehensive review of key legislation and policy provisions with regard to climate change adaptation. A discussion of the adaptation Planning and Management Phases was followed by an analysis of five key barriers of crosscutting importance. Notwithstanding, robust legislative and policy provisions render adaptation as a whole on the Coromandel Peninsula embryonic at best, despite a clear and urgent need for constructive action. This chapter's finding is in line with recent work

undertaken by Lawrence, et al. (2013, p. 18), who highlight that “[h]aving statutory duties by themselves is insufficient without the integration of practice under a supporting institutional architecture that can drive coherent action at the local level while reflecting community aspirations”. Such integration of practice and an overcoming of the dichotomy between rhetoric and reality require a close and critical look at the key barriers introduced as part of the framework by Moser and Ekstrom (2010).

9

Conclusion

Coastal communities are adversely affected by climate change related phenomena, including sea-level rise, increased magnitude and frequency of weather events and coastal erosion. Intensification of coastal development, as evidenced in many parts of the Coromandel Peninsula, is consequently exposing these communities to elevated levels of risk. Projected losses are likely to exceed the value of coastal infrastructure or property, potentially cause loss of life, and impinge on important ecosystem goods and services, public amenity values, as well as irreplaceable cultural values.

Adapting to climate change is a compelling imperative, but it constitutes a challenge that should not be underestimated. This research has revealed that gaps in understanding represent currently insurmountable barriers to adaptation. Furthermore, there are no ready-made “simple” solutions for translating available knowledge and understanding about climate change into practical actions in coastal communities. Solutions suggested by local stakeholders, including local authorities, are typically highly contested with risks and potential costs and benefits distributed differentially. Interdependencies are highly complex and a linear resolution is not feasible. Any approach that will do justice to local community reality must therefore be part of an “iterative, deliberately learning-oriented risk management framework” (Moser et al., 2012, p. 51).

This research adopts an ethnographic approach that underscores the need to understand the messy local factors and power networks encasing climate change adaptation barriers as well as opportunities. The insights presented in this

conclusion are based on a review of planning literature and political ecology, a framework to diagnose adaptation barriers, key research findings drawn from local community insights and an assessment of legislative provisions. The framework by Moser and Ekstrom (2010) divides the adaptation process into Understanding, Planning, and Management Phases. Each of these phases is partitioned into various stages. Key barriers to adaptation shape adaptation prospects. Moser and Ekstrom (ibid.) highlight that few adaptation processes have reached the Management Phase. The focus of Moser and Ekstrom's (ibid.) framework builds understanding about why barriers to adaptation arise and thus what might be done to overcome them. The rationale of my ethnographic case study research methodology is to navigate the complex terrain of contested community interests through the analysis of narratives. While the three case study examples of Te Puru, Te-Whanganui-o-Hei/Mercury Bay and Harataunga/Kennedy Bay build on Moser and Ekstrom's framework, my methodology targets a holistic insight into the factors shaping local adaptation reality.

Accordingly, the overall aim of my research was to find an answer to the question of what stands in the way of adapting to climate change on the Coromandel Peninsula. The research objectives underlying the above aim were to (i) explore the nature of human-environment relationships and how these shape climate change adaptation, (ii) analyse ways in which political ecology and planning address or enable adaptation, and then to (iii) make sense of local narratives in order to overcome adaptation barriers in particular local settings. Further, to (iv) deepen an understanding of the contested nature of adaptation, (v) determine what needs to be done to address the contested nature of adaptation and what particular issues need to be addressed, and finally (vi) establish future adaptation pathways based on local community reality and aspirations.

In this conclusion, I first present the key findings from my review of the planning and political ecology literature in Section 9.1. This review is followed by an outline of the framework I applied to diagnose the Coromandel Peninsula's adaptation

barriers in Section 9.2. In Section 9.3, I highlight the findings from an application of the insights from all three case study communities (Te Puru, Te-Whanganui-o-Hei/Mercury Bay, and Harataunga/Kennedy Bay). Section 9.4 summarises the findings of a review of legislative provisions, the Planning and Management Phases, as well as barriers of cross cutting importance. Five practical recommendations are made and discussed in Section 9.5.

9.1 Key findings from the literature review

Based on the literature reviewed, I built a case for an amalgamation of planning and political ecology to address the climate change adaptation imperative.

The following two key points represent the key findings from this review:

- While planning aims to solve place-based issues and realise the development aspirations of communities (ideally seeking to advance sustainable development), the “wicked problems” facing coastal communities defy comprehensive and final solutions. Despite the fact that planning practice seldom adequately addresses power inequalities, planning theory recognises the centrality of power. The challenge therefore lies in translating this understanding into practice in a local community setting.
- Addressing adaptation barriers through planning practice informed by insights from political ecology can assist in addressing the influential role of power and politics in community planning and decision-making. Ergo, I have established that political ecology complements planning in two pivotal ways: (i) through a holistic framing of human-nature relationships; and (ii) by bringing to the fore the pre-eminent role of power and politics in shaping trajectories of human development and environmental degradation.

Despite an underrepresentation of climate change in political ecology literature, the role of power and politics when it comes to climate change in general and coastal

issues in particular represents a vital aspect. The review has shown that planning recognises the importance of power and politics at a conceptual level (planning theory), yet in practice the result has been pervasive unsustainable development. Consequently, there is a need to better address power inequities in planning practice. Political ecology provides insights relevant to achieving this outcome. Political ecology is an inquiry into power and politics and the consequences of environmental degradation. A criticism of political ecology is that it is chiefly theoretical and lacking in practical application. Planning practice informed by insights about power and politics through this reflection on political ecology provides a practical mechanism within community planning. Central to achieving this outcome is opening up opportunities for divergent views to be aired, discussed and deliberated. Conflicting interests need to be resolved in ways that confront power inequities and advance prospects for sustainability, including building adaptive capacity and resilience. Central to such a resolution is an overcoming of adaptation barriers, which I outline in the following section.

9.2 Key findings from the coastal community case studies

Within academic publications providing answers to questions related to climate change adaptation, a shift has occurred from “rather simplistic assumptions about adaptive capacity” to a “welcome dose of pragmatic realism” (Ekstrom et al., 2011, p. 6). Despite such pragmatism increasingly applied to adaptation barrier research, ethnographic approaches within this field are underrepresented. In this research, I have shown that an ethnographic approach opens up insights into the multiple and locally contextualised dimensions within the case study communities, which may otherwise remain hidden. What is more, the ethnographic approach can connect adaptation barriers with local community reality. By doing justice to local community reality through the ethnographic approach, adaptation barriers have lost their abstraction and have become real and tangible. The diversity and complexity making up the three communities has shown that different barriers

affect different communities in different ways. This diversity and complexity is further differentiated by the distinctive voices that emerged from key participants.

One of the challenges for adaptation on the Coromandel Peninsula is that most communities are located on low-lying flood deltas prone to flooding. Further complicating matters from a physical perspective is the fact that these communities are typically backed by steep terrain with short catchments. High levels of physical vulnerability compound social vulnerability due to elevated levels of risk associated with climate change. Factors such as demographics, culture, attitudes towards risk, high levels of absentee property ownership as well as a low level of climate change salience affect adaptation prospects. Despite all three case study communities situated on the Coromandel Peninsula, the key recommendations from the participants in each community or professional sector vary considerably. This is so because of pivotal differences in physical setting, social composition, cultural backgrounds and discrepancies in risk perceptions and behaviour. The following three sub-sections feature the fundamental characteristics of the three case study examples and highlight the key insights obtained from this ethnography.

9.2.1 Te Puru

Te Puru on the western side of the Peninsula is characterised by an exceptionally high level of vulnerability to natural hazards with flooding representing the highest risk. The community is home to approximately 942 people with a wide diversity of individual backgrounds and ethnicities, and levels of hazards exposure. From the range of interviews conducted with research participants associated with the Te Puru community, two key views on climate change adaptation became apparent:

- Adaptation responsibilities primarily lie with local government. Participants recognised that council-led actions grounded in effective policy provisions are paramount to addressing adaptation barriers. Effective action, however,

remains elusive because policy provisions remain ineffective in enabling communities to adapt;

- Adaptation leadership is decisive in implementing adaptation policy and guidance for local government. Yet, for the time being, leadership is lacking mainly due to a lack of adaptation mandate.

Leadership is of particular significance because it is an adaptation barrier of repeated and cross-cutting importance (Moser & Ekstrom, 2010). This barrier (together with the other barriers of cross-cutting importance discussed in Section 9.4) was experienced in all three case study examples. Leadership influences all aspects of adaptation and can open up or close down opportunities to adapt. The issue of leadership is further entwined with power relationships in the community as questions arise who leads when and where, in whose interest and with what intended outcome? Such power has implications for how adaptation is dealt with in shaping patterns of coastal development as well public infrastructure and its maintenance. For example, the protection of beachfront properties from increased coastal erosion is specific to Te-Whanganui-o-Hei/Mercury Bay (discussed in the following subsection), whereas the construction of a bridge designed to accommodate a 1/100 year flood event is specific to Te Puru. The power executed through land-use planning decisions by community leaders (in this case exemplified by the bridge) thus shapes risk, resilience, and sustainability. Fundamentally, power becomes apparent in different ways, as insights from Te-Whanganui-o-Hei/Mercury Bay confirmed in the following case study example.

9.2.2 Te-Whanganui-o-Hei/Mercury Bay

Te-Whanganui-o-Hei/Mercury Bay on the Peninsula's east coast is a large natural harbour with a landscape and beaches of the kind sought by coastal property developers. In the course of a few decades, this area has undergone a rapid transformation as a result of the coastal allure. Whitianga, the main settlement of

the bay was converted into a resort town and has a current population of 4000. Some parts of the bay are made up of up to 80% holiday homes. The area's most pressing issues against the background of climate change are coastal erosion and flooding. Both hazards adversely affect beachfront properties in the bay. From the range of interviews conducted with research participants associated with this part of the Coromandel Peninsula, the following became apparent:

- Adaptation is given little consideration in coastal property development decisions because beachfront properties continue to be regarded as prime real estate. For example, houses are located on the seashore exposed to coastal hazards likely to be compounded by climate change with little prospect for relocation or risk mitigation); and
- Private interests dominate. Given that approximately \$1 billion of real estate is situated within the Coromandel coastal set-back zone alone (Hunter et al., 2010), public values appear secondary (e.g., beach access, unspoilt beachfront, no remnants from failed protection measures including rocks and timber on the beach). Te-Whanganui-o-Hei/Mercury Bay's scenic beauty coupled with intense coastal development sets this case study example apart.

While climate change adaptation is given little consideration, the recommendations for the future regarding coastal erosion and loss of beachfront property revolve around the protection of private interests. Within the upper third of the Peninsula, also on the east coast, Harataunga/Kennedy Bay is yet again very different to the previous two case studies, as summarised in the following sub-section:

9.2.3 Harataunga/Kennedy Bay

Harataunga/Kennedy Bay is different to Te Puru or the Te-Whanganui-o-Hei/Mercury Bay area predominantly because of: (i) a comparatively small

population size of approximately 120 people, most of whom consider themselves Māori, (ii) virtually no beachfront property development, (iii) comparative physical and social isolation (iv) a low economic status due to traditional land ownership structures (Māori land). The main reason Harataunga/Kennedy Bay was selected as one of the three case study communities is that it is predominantly Māori. Consequently, Māori insights, the region's diversity, but also variations in understandings of climate change adaptation (i.e., local Māori vs. beachfront holiday house owner) were identified.

The Insights from Harataunga/Kennedy Bay revealed a key factor fundamentally setting this community apart from the first two case study examples of Te Puru and Te-Whanganui-o-Hei/Mercury Bay:

- The immediate day-to-day challenges, stressors and vulnerabilities (e.g.; subsistence needs and living requirements, local feuds, and battles with local authorities) appear to override any concern with, attention to, or experience of longer-term climate change and/or adaptation imperatives. This is the case despite evidence that indigenous or traditional environmental knowledge (TEK) provides an historical account of climate change over the generations.

In Harataunga/Kennedy Bay climate change signals are not being detected and there is legacy of dysfunctional governance structures. This situation is complicated by an entrenched distrust for local government aspirations reflective of wider community views expressed through processes such as the Long-Term Plan (Ten Year Plan). The result is that adaptation is not an important consideration to those interviewed. While exposure to natural hazards in the community is comparatively low (primarily due to an absence of beachfront development), climate change will nonetheless require adaptation (e.g., due to loss of land). The loss of land due to coastal erosion will have a negative effect on the community, particularly against the background of their cultural and spiritual connection to land. Such a loss is

independent of any level of adaptation understanding or preparedness since and it cannot be compensated for. Without attention to adaptation barriers, any loss, whether primarily financial as in Te-Whanganui-o-Hei/Mercury Bay or spiritual as in the Harataunga/Kennedy Bay case study, will come unprepared and will be difficult to plan for let alone manage. Consequently, the insights from the case study examples benefited from a framing of adaptation barriers, which I discuss in the following section.

9.3 A framework to diagnose adaptation barriers

Following both the key findings from the literature review as well as the above data that emerged from my ethnographic work, I was confronted with questions to which answers were not apparent at the end of my fieldwork. The discovery of a framework to diagnose barriers to climate change adaptation by Moser and Ekstrom (2010) made it possible to frame responses to these questions. The framework by Moser and Ekstrom (2010) provides an effective starting point for identifying adaptation barriers and opportunities that can be identified and addressed by planning practices that are informed by insights from political ecology about the pivotal role of power and politics in shaping adaptation pathways and prospects. Specifically, the framework:

- Provided a foundation for drawing attention to cultural and political factors at the local level, inherent shortcomings in both planning and political ecology, and policies that fail to enable local communities to adapt; and
- Enabled key informant insights to be analysed from the perspective of adaptation barriers.

The framework by Moser and Ekstrom (2010) provided a coherent approach to examining climate change adaptation on the Coromandel Peninsula. Overall, it emerged that local community members remain stuck in the adaptation

framework's Understanding Phase. The Understanding Phase entails a detection of the problem, the gather/use of information, and finally a (re)definition of the problem. For now, low levels of problem detection dominate (the problem must be detected as part of understanding). In addition, participants feel powerless as they perceive to have little influence on decisions made by local authorities and climate change is often perceived as a problem too big to tackle.

The key finding that emerges by drawing on the framework by Moser and Ekstrom (2010) is that local community adaptation prospects are embedded in, influenced by and influence wider societal prospects for sustainability. Put simply, adaptation is as important as wider sustainability issues and how society deals with these. Overcoming barriers in the Understanding Phase is, therefore, paramount in order to progress to the Planning Phase and eventually the Management Phase in practice.

Building on the foundation of the three case study examples, I was able to reveal that current legislative adaptation provisions are insufficient for fostering adaptation understanding and practice, and that the remaining adaptation phases (Planning and Management) remain out of reach. Complicating matters further are barriers of cross-cutting importance as well as a legislative framework in need of improvement when it comes to local adaptation needs and aspirations.

9.4 Legislative provisions, subsequent adaptation phases and cross-cutting barriers

The ethnographic work undertaken as part of this research revealed that adaptation is currently not receiving the attention called for by the science community. All three cases study communities are governed by the same legislative and policy provisions, which seek sustainability outcomes but in practice do not secure such outcomes, a prospect that is bleak in the face of climate change. In practice legislative and policy provisions are impeded by prevailing inequitable power

relations. The key point this legislative review (following an analysis of key participant insights) highlights is the need for an integration of adaptation practice at the local level in ways that promote the adaptive capacity, resilience, and sustainability of local communities.

The assessment of legislation was set against the adaptation Planning and Management Phases as well as five key barriers of cross-cutting importance outlined in the framework by Moser and Ekstrom (2010), namely leadership, resources, communication and information, values and beliefs, and participation. Unlike the Understanding Phase, both the Planning and Management Phases depend heavily on enabling legislation and government support. However, paradoxically, legislation currently does not encourage adaptation, despite this being a requirement by statute. While anticipatory planning approaches for elevated levels of risk in connection with climate change are included in legislation, long-term legislative considerations taking into account the dynamics of exponentially rising risk are weak. Currently, the only exception remains the New Zealand Coastal Policy Statement (2010) and its reference to managed retreat as an adaptation measure.

Fundamentally, building more effective legislative support will require a robust review of existing policies, incorporation of the latest scientific climate change findings, a review of the ways policies are implemented, and a critical examination of ways to prevent local property owners and developers bypassing these provisions. As it stands, statutory provisions are not resulting in sustainable adaptation outcomes that secure public safety in the face of escalating climate risk. Reasons include that the RMA, for example, is non-prescriptive when it comes to risk. Because local authorities hold responsibility for the management of risks, there is no consistent approach to adaptation. In practice, this means that in addition to the social and physical differences illustrated here on the basis of the case study examples, responses to risk are not unified. Indeed, responses to risk tend to be reactive, ad hoc and often driven by vested interests (e.g., coastal armouring to

protect exposed beachfront properties) rather than geared to promoting community safety, resilience and sustainability. Consequently, for those in exposed localities, risk reduction through planning becomes a challenging task in times of escalating risk. This situation is amplified at the intersection of climate change and coastal development intensification. The review of the legislative provisions has shown that pertinent legislation has many positive features while systemic shortcomings need to be addressed in context; with the challenge of translating rhetoric into practical reality being the challenge.

In addition to legislative shortcomings, insights from participants from all three case study examples have shown that central government positioning is perceived as pivotal for advancing adaptation in practice. Recent legislative reforms have not fostered adaptive capacity at the local level. Resource Management Act reforms have focused considerable attention on creating more cost effective and timely planning processes. The downside has been that the reforms have been at the expense of meaningful opportunities for community engagement. The recent Local Government Act reforms (passed in December 2012) depreciate the fundamental purpose of local government and shift from consideration of sustainability well-beings to a narrower scope of cost-effective and affordable public service provision. While the objective of these reforms is to reduce costs and time involved in planning processes and governance more generally, such reforms focus less attention on local long-term community needs. Indeed, such reforms close down rather than open up opportunities for deliberation and community resolution of vexing concerns including building adaptive capacity, resilience and sustainability. Despite positive intentions, the consequences may be detrimental to community well-being in the face of climate change. Charting a path that is iterative and allows for learning as climate change unfolds will require a legislative and policy environment that enhances the opportunities to overcome adaptation barriers.

Despite what I have defined as prevailing “business as usual”, two local examples aimed at overcoming shortcomings in legislation and practice to address

crosscutting barriers stand out: The Coastal Adaptation to Climate Change (CACC) project was launched in Whitianga by NIWA in 2009 and aimed at engaging with the local community. The objectives were to (i) get the 'right' people to the table; (ii) achieve consensus and representative decision-making; (iii) personalise the impacts of climate change; and (iv) enable an appropriate and meaningful inclusion of scientific information. Similarly, the second initiative setting a foundation for addressing adaptation barriers is the *Whitianga Coastal Futures* initiative. The key aspect of the work undertaken by NIWA as well as the local authorities was to create opportunities for deliberation, dialogue, and learning and to create practical opportunities for discussions to unfold and identify opportunities to adapt to climate change. Ideally, all the key aspects that have shaped the above work should be included as part of the recommendations made in the following section.

9.5 Recommendations

Through the unification of local adaptation insights from participants, this ethnographic case study research has made possible the telling of the Coromandel story about adaptation prospects and the search for adaptation pathways. Based on the insights provided, five key recommendations have emerged. The local needs, interests, barriers and opportunities which have emerged from participant insights and their structuring according to the adaptation barriers framework by Moser and Ekstrom (2010) have enabled a division of the recommendations into short (within New Zealand's comparatively short electoral cycle of three years), medium (within five to ten years - related to the Ten Year Plan), and genuinely long term priorities (within a generation cycle of up to 30 years). For example, influencing local attitudes cannot be realised in the short term, and research is a medium to long-term commitment that requires resources (e.g., financial, technical, or technological, expertise input and time). Similarly, strategically addressing adaptation apathy and overcoming systemic barriers requires a long-term approach. Bringing climate change adaptation out into the open by visualising

adaptation issues, challenges, opportunities and prospects and/or involving local schools can be put into practice within a shorter time frame. The following five recommendations represent the lessons learned from this research:

1. Create a legitimate local and national adaptation mandate (short term):

Local authorities (with support from higher authorities, including the Ministry for the Environment) need to create an enabling environment for adaptation leadership to rise to the challenges presented by climate change. Ideally, such an environment should be detached from political cycles. Participant insights from Te Puru in particular have identified the need for adaptation leadership. Without leadership locals feel there is no incentive to adapt. The adaptation barriers framework confirms the importance of leadership, being committed to building the requisite understanding and adaptive capacity across all spheres of government as well as amongst governance actors involved in coastal community planning and decision-making. Inherent in the creation of such a mandate is the prioritisation of resources. Adaptation needs to be mainstreamed into coastal community planning and decision-making processes, with adequate provision of resources to build the necessary community capacity.

2. Make coastal issues a matter of public interest (short-term): Adaptation opportunities need to be explored in ways in which adaptation issues, challenges, opportunities and prospects can become more visible to local communities. For example, following a competition for best ideas, local artists could be contracted to visualise a one-metre rise in sea level. Such a line could be mapped using cutting-edge software and data, which the artists could then transfer into the real world (e.g., by painting lines on roads or power/telephone poles). The result will be that community members will be visually confronted with climate change related issues such as sea-level rise. At the time this research was undertaken, the local print media and the local radio station were unwilling to engage with the topic, despite repeated efforts to conduct interviews and have climate change discussions on the

local radio. The media could play a powerful, informing and mobilising role, especially in tandem with community leaders, key interest groups and the local authorities. Adaptation initiatives in which local media could take interest, for example, may involve the Te Puru School, the Mercury Bay Area School, and the Te Kura Kaupapa Maori o Harataunga in Kennedy Bay. School initiatives could draw public attention and stimulate media coverage and consequently awareness and understanding of climate change and the adaptation imperative. Alternatively and for the time being, a targeted focus on coastal issues (leaving climate change and adaptation aside) could potentially remove barriers associated with the contested issue of climate change while aiming for the same outcome of a reconciliation of contested interests. The insights from participants have shown that climate change can be entirely dismissed. The result is that some locals may not want to be involved in anything that has climate change (or adaptation) in its name or programme. In principle, coastal issues are associated with risk, change, dynamism and unpredictability. Climate change will exacerbate any issues coastal communities are already grappling with. Therefore addressing coastal issues alone can prove to be a promising step in the right direction.

- 3. Take advantage of previous work undertaken (short term):** Local authorities need to take advantage of the entry points created by the CACC and Whitianga Futures projects, build on the momentum gained, and strategically focus on and engage targeted coastal communities in the region. Ideally, key stakeholders, including the Māori Trust Board, elected councillors, the insurance industry, NGOs, the Department of Conservation, the Transport Authority, and local knowledge carriers (both Māori and Pākehā) should be included. Such institutional opportunities beyond policy prescription and practice are vital to stimulate dialogue and conversations. Such conversations need to deliberately address power issues, culture, values, interests, and priorities and enable the burgeoning of learning, trust,

understanding and creativity as part of actively removing adaptation barriers.

- 4. Strategically address adaptation apathy (medium to long term):** Local communities should seek to build better understanding of the challenges and opportunities for aligning short- and longer-term community interests as well as public and private interests. Inherent in this undertaking is recognition of inevitable tensions and trade-offs. Arguably, such acknowledgement and understanding will raise concerns about the risks associated with climate change. However, until locals pass a threshold of concern and the problem is adequately detected, adaptation action is unlikely to emerge. Feelings of powerlessness, exclusion from the decision-making process, and the perception of authority-decisions as pre-determined currently stand in the way. Until opportunities for dialogue are created (particularly against the risk of such opportunities being closed down as a result of legislative reforms in the LGA and RMA), formal institutions and mechanisms for dialogue through, for example, legislative provisions need to be distinguished from informal institutions and mechanisms that take place outside of the legislative context, typically in civil society. The approach then becomes a matter of creating opportunities for such dialogue and engagement to take place in places like schools or community based organisations. Such opportunities will enable communities to develop from where they are to where they need and, eventually, want to be.
- 5. Stimulate research (medium to long term):** National multidisciplinary adaptation research has the potential to enhance local adaptation efforts. International adaptation research is increasingly drawing attention to adaptation's "wickedness" and the need for a reconciliation of contested interests (e.g., Clarke et al., 2013; Haasnoot, Kwakkel, Walker, & ter Maat, 2013; Lloyd, Peel, & Duck, 2013; Moser, 2014; O'Toole & Coffey, 2013). Holistic understanding of the social-ecological setting of the climate change

adaptation imperative can be promoted through such research to support and advance adaptation planning and decision-making. Research is needed to better understand and compare adaptation barriers in different local communities and between different regions and countries. Further, the findings of this PhD research could be put to the test and applied to other regions. As barriers are better understood, resource allocation decisions could become more informed by evidence. Further, barriers could be targeted more efficiently and critical questions, particularly with regard to how to build adaptive capacity, could be answered.

Beyond the above recommendations, any progress made in addressing the barriers presented will have to take into consideration the development of institutions and processes that enable local key stakeholder voices to become more prominent formal planning provisions and practices. Therefore, adaptation decisions in the Coromandel need to take into consideration the breadth of voices reflected in this research. These include beachfront property owners, coastal property developers, local authorities, traditional environmental knowledge (TEK) carriers, the insurance industry, politicians, physical and social scientists, and public infrastructure providers such as the New Zealand Transport Authority. Consent decisions, roading decisions, coastal setback lines, community aspirations, public amenity values, culture, and values need to be articulated and reconciled and in so doing play a vital role in overcoming adaptation barriers. Inherent in an advancement of adaptation is an acknowledgement of the messiness of the issue set in a contradictory, evolving, and ever-changing environment. All actors involved and affected should partake in a deliberate move that opens up opportunities for contestation to happen in an authentic, consequential and inclusive manner beyond any conventional and routine execution of specified plans and law. The facilitation of adaptation should focus on long-term and sustainable coastal management practices, which will assist in overcoming barriers and shaping more resilient communities.

REFERENCES

- Adger, W. N. (2006). Vulnerability. *Global Environmental Change (Special issue on Vulnerability, Resilience and Adaptation)*, 16(3), 268-281.
- Adger, W. N., Agrawala, S., Mirza, M. M. Q., Conde, C., O'Brien, K., Pulhin, J., & et al. (Eds.). (2007). *Assessment of adaptation practices, options, constraints and capacity*. Cambridge, UK: Cambridge University Press.
- Adger, W. N., Arnell, N. W., & Tompkins, E. L. (2005a). Adapting to climate change: perspectives across scales. *Global Environmental Change*, 15(2), 75-76.
- Adger, W. N., Arnell, N. W., & Tompkins, E. L. (2005b). Successful adaptation to climate change across scales. *Global Environmental Change* 15, 77-86.
- Adger, W. N., Benjaminsen, T. A., Brown, K., & Svarstad, H. (2001). Advancing a Political Ecology of Global Environmental Discourses. *Development and Change*, 32(4), 681-715. doi: 10.1111/1467-7660.00222
- Adger, W. N., Brown, K., & Tompkins, E. L. (2005). The Political Economy of Cross-Scale Networks in Resource Co-Mangement *Ecology and Society*, 10(2).
- Adger, W. N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D., . . . Wreford, A. (2009). Are there social limits to adaptation to climate change? *Climatic Change*, 93(3), 335-354.
- Adger, W. N., Lorenzoni, I., & O'Brien, K. L. (Eds.). (2009). *Adapting to Climate Change: Thresholds, Values, Governance*. Cambridge: Cambridge University Press.
- Agrawal, A. (2008). *The role of local institutions in adaptation to climate change* Paper presented at the Papers of the Social Dimensions of Climate Change Workshop, Washington, DC.
- Agrawal, A. (2010). Local Institutions and Adaptation to Climate Change. In R. Mearns & A. Norton (Eds.), *Social Dimensions of Climate Change* (pp. 173). Washington, DC: The World Bank
- Agyeman, J., Doppelt, B., Lynn, K., & Hatic, H. (2007). The climate-justice link: Communicating risk with low-income and minority audiences. In S. C. Moser & L. Dilling (Eds.), *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change* (pp. 119-138). Cambridge, UK: Cambridge University Press
- Ahmed, E., Elgazzar, A. S., & Hegazi, A. S. (2005). An overview of complex adaptive systems. *Cornell University Library, arXiv.org, arXiv preprint nlin/0506059*.
- Airoldi, L., Abbiati, M., Beck, M. W., Hawkins, S. J., Jonsson, P. R., Martin, D., . . . Berg, P. (2005). An ecological perspective on the deployment and design of low-crested and other hard coastal defence structures. *Coastal*

- Engineering*, 52, 1073-1087.
- Aitken, C., Chapman, R., & McClure, J. (2011). Climate change, powerlessness and the commons dilemma: Assessing New Zealanders' preparedness to act. *Global Environmental Change*, 21(2), 752-760.
- Alberti, M. (2008). *Advances in urban ecology: integrating humans and ecological processes in urban ecosystems*. New York: Springer.
- Albrechts, L. (2004). Strategic (spatial) planning reexamined. *Environment and Planning B: Planning and Design*, 31, 743-758.
- Alexander, E. R. (1997). A mile or a millimetre? Measuring the 'planning theory-practice gap'. *Environment and Planning, B*(24), 3-6.
- Alexander, K. S., Ryan, A., & Measham, T. G. (2011). Managed Retreat of Coastal Communities: Understanding Responses to Projected Sea Level Rise *Socio-Economics and the Environment in Discussion* (Vol. 2011-01). Canberra, AUS: CSIRO.
- Allmendinger, P., & Haughton, G. (2009). Soft spaces, fuzzy boundaries, and metagovernance: the new spatial planning in the Thames Gateway. *Environment and Planning, 41*(A), 617-633.
- Allmendinger, P., & Haughton, G. (2010). Spatial planning, devolution, and new planning spaces. *Environment and Planning C: Government and Policy*, 28, 803-818.
- Allmendinger, P., & Tewdwr-Jones, M. (2002). The Communicative Turn in Urban Planning: Unravelling Paradigmatic, Imperialistic and Moralistic Dimensions. *Space and Polity*, 6(1), 5-24.
- Anderegg, W. R. L., Prall, J. W., Harold, J., & Schneider, S. H. (2010). Expert credibility in climate change. *Proceedings of the National Academy of Sciences*, 107(27), 12107-12109. doi: 10.1073/pnas.1003187107
- Anderies, J. M., Janssen, M. A., & Ostrom, E. (2004). A Framework to Analyze the Robustness of Social-ecological Systems from an Institutional Perspective. *Ecology and Society*, 9(1).
- Anderson, D. (2008). Drought, Endurance and 'The Way Things Were': The Lived Experience of Climate and Climate Change in the Mallee. *Australian Humanities Review*(45).
- Anderson, D. (2010). Drought, endurance and climate change 'pioneers': lived experience in the production of rural environmental knowledge. *Cultural Studies Review*, 16(1), 82-101.
- Anderson, E. (2009). Urban Ethnography: Its Traditions and its Futures. *Ethnography*, 10, 371-568.
- Anderson, K., & Bows, A. (2012). A new paradigm for climate change. *Nature Clim. Change*, 2(9), 639-640.
- ARC. (2004). Hauraki Gulf State of the Environment Report - Coastal Hazards of the Gulf. Auckland: Auckland Regional Council.
- Ariza-Montobbio, P., Lele, S., Kallis, G., & Martinez-Alier, J. (2010). The political ecology of Jatropha plantations for biodiesel in Tamil Nadu, India. *The Journal of Peasant Studies*, 37(4), 875-897. doi: 10.1080/03066150.2010.512462
- Arthur, S., & Nazroo, J. (2003). Designing Fieldwork Strategies and Materials. In J. Ritchie & J. Lewis (Eds.), *Qualitative Research Practice* (pp. 109-137). London: Sage

- Artur, L., & Hilhorst, D. (2012). Everyday realities of climate change adaptation in Mozambique. *Global Environmental Change*, 22(2), 529-536.
- Atkinson, P., Coffey, A., Delamont, S., Lofland, J., & Lofland, L. (Eds.). (2001). *Handbook of Ethnography*. London: Sage.
- Atkinson, P., & Hammersley, M. (1994). Ethnography and participant observation. In N. Denzin & Y. Lincoln (Eds.), *Handbook of Qualitative Research* (pp. 248-261). Thousand Oaks, CA: Sage
- Avineri, S. (1975). *The social and political thought of Karl Marx*. London: Cambridge University Press.
- Bachcare. (2013). Paradise Found - Whitianga Beachfront Holiday House. Retrieved 28.04.2013, 2013, from http://www.bachcare.co.nz/accommodation-holiday-homes/coromandel~east_coast_coromandel~whitianga~2101
- Bamber, J. L., & Aspinall, W. P. (2013). An expert judgement assessment of future sea level rise from the ice sheets. *Nature Climate Change*, advance online publication.
- Barley, N. (2000). *The Innocent Anthropologist*. Prospect Heights, IL: Waveland Press.
- Barley, S. (1990). Images of imaging: notes on doing longitudinal fieldwork. *Organization Science*, 1, 220-247.
- Barlow, C. (1994). *Tikanga whakaaro: key concepts in Maori culture*. Auckland, N.Z.: Oxford University Press.
- Barnes, J., Dove, M., Lahsen, M., Mathews, A., McElwee, P., McIntosh, R., . . . Yager, K. (2013). Contribution of anthropology to the study of climate change. *Nature Clim. Change*, 3(6), 541-544.
- Barnett, J. (2006). Climate Change, Insecurity, and Injustice. In N. Adger, J. Paavola, S. Huq & M. J. Mace (Eds.), *Fairness in Adaptation to Climate Change* (pp. 115-130). Cambridge, MA: MIT Press
- Barnett, J., & O'Neill, S. (2010). Maladaptation. *Global Environmental Change*, 20, 211-213.
- Barron, S., Canete, G., Carmichael, J., Flanders, D., Pond, E., Sheppard, S., & Tatebe, K. (2012). A Climate Change Adaptation Planning Process for Low-Lying, Communities Vulnerable to Sea Level Rise. *Sustainability*, 4(9), 2176-2208.
- Barry, J. (2012). *The Politics of Actually Existing Unsustainability: Human Flourishing in a Climate-Changed, Carbon-Constrained World*. Oxford, UK: Oxford University Press.
- Basso, K. (1996). Wisdom sits in places: Notes on a western Apache landscape In K. Basso & S. Feld (Eds.), *Senses of Places*. Santa Fe, NM: School of American Research Press
- Baxter, J., & Eyles, J. (1997). Evaluating qualitative research in social geography: Establishing 'rigour' in interview analysis. *Transactions of the Institute of British Geographers*, 22(4), 505-525.
- Bazerman, M. H. (2006). Climate Change as a predictable surprise *Climatic Change*, 77(1-2), 179-193.
- Beca. (2007). Profile Statement: demographic. Hamilton, NZ: Beca Carter Hollings & Ferner Ltd.
- Becker, L. W. (1983). Studying the urban school. *Anthropology and Education*

- Quarterly*, 14(2), 98-108.
- Bennett, A. (2012, June 8, 2012). Govt offers new oil and gas exploration permits, *New Zealand Herald*.
- Bennett, K., & Shurmer-Smith, P. (2001). Writing Conversation. In M. Limb & C. Dwyer (Eds.), *Qualitative Methodologies for Geographers: Issues and Debates*. London: Arnold
- Berger, J. (1992). *Keeping a Rendezvous*. New York: Vintage.
- Berinsky, A. J., & Kinder, D. R. (2006). Making Sense of Issues Through Media Frames: Understanding the Kosovo Crisis. *Journal of Politics*, 68(3), 640-656.
- Berkes, F. (2002). Cross-Scale Institutional Linkages: Perspectives from the Bottom Up. In E. Ostrom, T. Dietz, N. Dolsak, P. C. Stern, S. Stonich & E. U. Weber (Eds.), *The Drama of the Commons* (pp. 293-321). Washington, DC: The National Academies Press
- Berkes, F. (2007). Understanding uncertainty and reducing vulnerability: lessons from resilience thinking. *Natural Hazards*, 41(2), 283-295. doi: 10.1007/s11069-006-9036-7
- Berkes, F. (2008). *Sacred Ecology* (2 ed.). Philadelphia: Taylor and Francis.
- Berkes, F., Colding, J., & Folke, C. (2000). Rediscovery of Traditional Ecological Knowledge as Adaptive Management. *Ecological Applications*, 10(5), 1251-1262.
- Berkes, F., Colding, J., & Folke, C. (2001). *Linking Social-Ecological Systems*. Cambridge: Cambridge University Press.
- Berkes, F., Colding, J., & Folke, C. (Eds.). (2003). *Navigating social-ecological systems: building resilience for complexity and change*. Cambridge New York: Cambridge University Press.
- Berkes, F., & Folke, C. (1998). Linking social and ecological systems for resilience and sustainability. In F. Berkes & C. Folke (Eds.), *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience* (pp. 1-25). Cambridge, UK: Cambridge University Press
- Berkes, F., & Jolly, D. (2002). Adapting to climate change: Social-ecological resilience in a Canadian Western Arctic community. *Conservation Ecology*, 5(2). doi: 18
- Berkhout, F., Hertin, J., & Gann, D. M. (2006). Learning to adapt: Organisational adaptation to climate change impacts *Climate Change*(78), 135-156.
- Bernard, H. R. (2011). *Research Methods in Anthropology: Qualitative and Quantitative Approaches* (5 ed.). Plymouth, UK: AltaMira.
- Bernauer, T. (2013). Climate Change Politics. *Annual Review of Political Science*, 16(1). doi: doi:10.1146/annurev-polisci-062011-154926
- Bess, R. (2001). New Zealand's indigenous people and their claims to fisheries resources. *Marine Policy*, 25(1), 23-32. doi: [http://dx.doi.org/10.1016/S0308-597X\(00\)00032-4](http://dx.doi.org/10.1016/S0308-597X(00)00032-4)
- Beston, A. (2004, July 7). Unrelenting Boom Threat to Whitianga Township, *New Zealand Herald*.
- Beston, A. (2005). Coastal Allure Hauraki Gulf's Main Peril, *New Zealand Herald*. Retrieved from http://www.nzherald.co.nz/whangamata/news/article.cfm?l_id=500611&object

[id=10116753](#)

- Biersack, A. (2006). *Reimagining Political Ecology* London: Duke University Press.
- Biesbroek, G. R., Klostermann, J., Termeer, C. J. A. M., & Kabat, P. (2011). Barriers to climate change adaptation in the Netherlands. *Climate Law*, 2(2), 181-199. doi: 10.3233/cl-2011-033
- Biesbroek, G. R., Swart, R. J., Carter, T. R., Cowan, C., Henrichs, T., Mela, H., . . . Rey, D. (2010). Europe adapts to climate change: Comparing National Adaptation Strategies. *Global Environmental Change*, 20(3), 440-450.
- Biesbroek, G. R., Swart, R. J., & van der Knaap, W. G. M. (2009). The mitigation-adaptation dichotomy and the role of spatial planning. *Habitat International*, 33(3), 230-237.
- Biesbroek, G. R., Termeer, C. J. A. M., Kabat, P., & Klostermann, J. (2009). *Institutional governance barriers for the development and implementation of climate adaptation strategies* Paper presented at the Earth System Governance: People, Places and the Planet, Amsterdam.
- Billington, J. H. (2009). *Fire in the Minds of Men: Origins of the Revolutionary Faith*. New Brunswick: Transaction Publishers.
- Birkenholtz, T. (2012). Network political ecology: Method and theory in climate change vulnerability and adaptation research. *Progress in Human Geography*, 36(3), 295-315. doi: 10.1177/0309132511421532
- Birkmann, J., Garschagen, M., Kraas, F., & Quang, N. (2010). Adaptive urban governance: new challenges for the second generation of urban adaptation strategies to climate change *Sustainable Science*, 5, 185-206.
- Birkmann, J., & von Teichman, K. (2010). Integrating disaster risk reduction and climate change adaptation: key challenges - scales knowledge and norms *Sustainability Science*, 5, 171-184.
- Blackett, P., Hume, T., & Dahm, J. (2010). Exploring the social context of coastal erosion management in New Zealand: What factors drive particular environmental outcomes? *The Australasian Journal of Disaster and Trauma Studies*, 1.
- Blackett, P., Smith, E., Rouse, H., Hume, T., Rickard, D., Hume, A., . . . Pickett, V. (2010). How can we engage with coastal communities over adaptation to climate change?: A case study in Whitianga on the Coromandel Peninsula. Christchurch, NZ: National Institute of Water and Atmospheric Research (NIWA).
- Blaikie, P., & Brookfield, H. (1987). *Land Degradation and Society* London: Methuen.
- Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (1994). *At Risk: Natural hazards, people's vulnerability, and disasters*. New York: Routledge.
- Blennow, K., & Persson, J. (2009). Climate change: Motivation for taking measure to adapt. *Global Environmental Change*, 19(1), 100-104.
- Bless, H., Fiedler, K., & Strack, F. (2004). *Social cognition: How individuals construct social reality*. Oxford, UK: Psychology Press.
- Block, E. (2012). 'That's what I see': Enhancing AIDS intervention research through deep ethnography. *Qualitative Social Work*, 11(4), 379-394. doi: 10.1177/1473325012438632
- Boelens, L. (2010). Beyond the limits of imperfections: Reflections on David

- Webb's comments on an actor-relational-approach in planning. *Planning Theory*.
- Boettke, P. J., Coyne, C. J., & Leeson, P. T. (2008). Institutional stickiness and the new development economics. *American Journal of Economics and Sociology*, 67(2), 331-358.
- Bohle, H.-G., Downing, T. E., & Watts, M. J. (1994). Climate change and social vulnerability: towards a sociology and geography of food uncertainty. *Global Environmental Change*, 4(1), 37-48.
- Bostrom, A., Morgan, M. G., Fischhoff, B., & Read, D. (1994). What Do People Know About Global Climate Change? 1. Mental Models. *Risk Analysis*, 14(6), 959-970. doi: 10.1111/j.1539-6924.1994.tb00065.x
- Bourassa, S. C., & Strong, A. L. (2002). Restitution of land to New Zealand Maori: the role of social structure. *Pacific Affairs*, 227-260.
- Brace, C., & Geoghegan, H. (2011). Human geographies of climate change: Landscape, temporality, and lay knowledges. *Progress in Human Geography*, 35(3), 284-302. doi: 10.1177/0309132510376259
- Brechin, S. R. (2008). Ostriches and Change: A Response to 'Global Warming and Sociology'. *Current Sociology*, 56(3), 467-474. doi: 10.1177/0011392107088239
- Breitburg, D. L., Hondorp, D. W., Davias, L. A., & Diaz, R. J. (2009). Hypoxia, nitrogen, and fisheries: integrating effects across local and global landscapes. *Annual Review of Marine Science*, 1, 329-349.
- Bremer, S., & Glavovic, B. (2013). Exploring the science-policy interface for Integrated Coastal Management in New Zealand. *Ocean & Coastal Management*, 84(0), 107-118. doi: <http://dx.doi.org/10.1016/j.ocecoaman.2013.08.008>
- Bridle, J. R., Gavaz, S., & Kennington, W. J. (2009). Testing limits to adaptation along altitudinal gradients in rainforest *Drosophila*. *Proceedings of the Royal Society B: Biological Sciences*, 276(1661), 1507-1515. doi: 10.1098/rspb.2008.1601
- Brigham-Grette, J., Anderson, S., Clague, J., Cole, J., Doran, P., Gillespie, A., . . . Styles, B. (2006). Petroleum geologists' award to novelist Crichton is inappropriate. *Eos Trans. AGU*, 87(36). doi: 10.1029/2006eo360008
- Brown, K., & Rosendo, S. (2000). Environmentalists, rubber tappers and empowerment: the politics and economics of extractive reserves. *Development and Change*, 31, 201-227.
- Brown, P. (2013). *Lessons learnt from San Francisco - implementing adaptation in the bay for critical infrastructure*. Paper presented at the National Adaptation Conference, Sydney, NSW.
- Brulle, R. J. (2010). From Environmental Campaigns to Advancing the Public Dialog: Environmental Communication for Civic Engagement. *Environmental Communication: A Journal of Nature and Culture*, 4(1), 82-98. doi: 10.1080/17524030903522397
- Bruner, J. (1990). *Acts of Meaning*. Cambridge, MA: Harvard University Press.
- Bruner, J. (1991). The narrative construction of reality. *Critical Inquiry*, 18, 1-21.
- Bryant, R. L. (1992). Political ecology: an emerging research agenda in Third-World studies *Political Geography*, 11(1), 12-36.
- Bryant, R. L. (2001). Political ecology: a critical agenda for change? . In N.

- Castree & B. Braun (Eds.), *Social nature: theory, practice and politics* (pp. 151-169). Oxford, UK: Blackwell
- Bryant, R. L., & Bailey, S. (1997). *Third World Political Ecology*. London: Routledge.
- Bulkeley, H. (2006). A changing climate for spatial planning. *Planning Theory and Practice*, 7, 201-230.
- Burnard, P. (1991). A method of analysing interview transcripts in qualitative research. *Nurse Education Today*, 11(6), 461-466.
- Burton, I. (1997). Vulnerability and Adaptive Response in the Context of Climate and Climate Change. *Climatic Change*, 36(1), 185-196.
- Burton, I. (2004). *Climate change and the adaptation deficit*. Paper presented at the International Conference on Adaptation Science, Mangement and Policy Options, Lijang, Yunnan, China.
<http://frogwatch.ca/Publications/5580FFCC-C0D2-43EB-B390-705B767EA200%5COccaisionalPaper1English.pdf>
- Burton, I. (2009). Climate change and the adaptation deficit. In E. L. F. Schipper & I. Burton (Eds.), *The Earthscan Reader on Adaptation to Climate Change*. London: Earthscan
- Burton, I., Kates, R. W., & White, G. F. (1993). *The environment as hazard* (2 ed.). New York: The Guilford Press.
- Burton, I., & Van Aalst, M. K. (2004). Look before you leap: A risk management approach for integrating climate change adaptation into world bank operations (Vol. 100). Washington, DC: The World Bank.
- Calvey, D. (2011). Book review: Elijah Anderson (ed.), 'The Enduring Legacy of Urban Ethnography: Myth and Reality' and 'Urban Ethnography: Its Traditions and its Futures'. Special, double issue: *Ethnography* 10(4), December 2009 and 11(1), March 2010. *Qualitative Research*, 11, 214.
- Cameron, L. (2006). Environmental Risk Management in New Zealand - is there scope to apply a more generic framework? *NZ Treasury Policy Perspectives Paper* (Vol. 06/06): New Zealand Treasury.
- Campbell, H. (2002). Planning: an idea of value. *Town Planning Review*, 73(3), 271-288. doi: 10.3828/tpr.73.3.3
- Campbell, H. (2006). Is the Issue of Climate Change too Big for Spatial Planning? *Planning Theory and Practice*, 7(2), 201-230.
- Campbell, T. (2009). Learning cities: Knowledge, capacity and competitiveness. *Habitat International*, 33(2), 195-201.
- Cannon, T., & Müller-Mahn, D. (2010). Vulnerability, resilience and development discourses in context of climate change. *Natural Hazards*, 55(3), 621-635.
- Carvalho, A. (2007). Ideological cultures and media discourses on scientific knowledge: re-reading news on cliamte change. *Public Understand of Science*, 16, 223-243.
- Carvalho, A., & Peterson, T. R. (Eds.). (2012). *Climate Change Politics*. Amherst, NY: Cambria Press.
- Cash, D. W., Adger, N., Berkes, F., Garden, P., Lebel, L., Olsson, P., . . . Young, O. (2006). Scale and Cross-Scale Dynamics: Governance and Information in a Multilevel World. *Ecology and Society*, 11(2).
- Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., . . . Mitchell, R. B. (2003). Knowledge systems for sustainable

- development. *Proceedings of the National Academy of Sciences*, 100(14), 8086-8091. doi: 10.1073/pnas.1231332100
- Cassell, C., & Symon, G. (Eds.). (2004). *Essential Guide to Qualitative Methods in Organizational Research*. London: Sage.
- Cavaye, A. L. M. (1996). Case study research: a multi-faceted research approach for IS. *Info Systems J*, 6, 227-242.
- Cefkin, M. (Ed.). (2010). *Ethnography and the Corporate Encounter* New York: Berghahn Books.
- Cetina, K. K., Schatzki, T. R., & Von Savigny, E. (2000). *The practice turn in contemporary theory*. London: Routledge.
- Challen, C. (2009). *Too Little, Too Late: The Politics of Climate Change*. Hove, UK: Picnic Publishing.
- Chapin, F. S. I., Carpenter, S. R., Kofinas, G. P., Folke, C., Abel, N., Clark, W. C., . . . Swanson, F. J. (2010). Ecosystem stewardship: sustainability strategies for a rapidly changing planet. *Trends in Ecology & Evolution*, 25(4), 241-249.
- Charmaz, K. (2011). Methods in Social Justice Research. In N. Denzin & Y. Lincoln (Eds.), *The Sage Handbook of Qualitative Research* (4 ed., pp. 359-380). Thousand Oaks, CA: Sage
- Cheng, A. S., & Daniels, S. E. (2003). Examining the Interaction Between Geographic Scale and Ways of Knowing in Ecosystem Management: A Case Study of Place-Based Collaborative Planning. *Forest Science*, 49(6), 841-854.
- Chilcott, J. H. (1987). Where Are You Coming from and Where Are You Going? The Reporting of Ethnographic Research. *American Educational Research Journal*, 24(2), 199-218. doi: 10.2307/1162891
- Cialdini, R. B. (1993). *Influence: The Psychology of Persuasion* (2 ed.). New York: Quill - William Morrow.
- Cinner, J. E., McClanahan, T. R., Graham, N. A. J., Daw, T. M., Maina, J., Stead, S. M., . . . Bodin, Ö. (2012). Vulnerability of coastal communities to key impacts of climate change on coral reef fisheries. *Global Environmental Change*, 22(1), 12-20. doi: <http://dx.doi.org/10.1016/j.gloenvcha.2011.09.018>
- CIP. (2013). Planning is... Retrieved 25.01.2013, 2013, from <http://www.cip-icu.ca/web/la/en/pa/8A42701CE9614894BE88DE93B8DA7C97/template.asp>
- Clare, J. P. (2012). Axolotls. 2013, from <http://www.axolotl.org/index.htm>
- Clarke, B., Stocker, L., Coffey, B., Leith, P., Harvey, N., Baldwin, C., . . . Cannard, T. (2013). Enhancing the knowledge-governance interface: Coasts, climate and collaboration. *Ocean & Coastal Management*, 86(0), 88-99. doi: <http://dx.doi.org/10.1016/j.ocecoaman.2013.02.009>
- Climate Institute. (2010). Moving Climate Protection onto the International Agenda 1986-1992. Retrieved 10.08.2013, 2013, from <http://www.climate.org/about/history.html>
- Cohen, M. D., March, J. G., & Olsen, J. P. (1972). A garbage can model of organisational choice. *Administrative Science Quarterly*, 17, 1-25.
- Collier, J., & Collier, M. (1986). *Visual Anthropology: Photography as a Research Method*. Albuquerque, NM: University of New Mexico Press.
- Collins, D. (2013). Gentrification or 'multiplication of the suburbs'? Residential development in New Zealand's coastal countryside. *Environment and*

- Planning A*, 45(1), 109-125.
- Coombes, B. (2003). The Historicity of Institutional Trust and the Alienation of Maori Land for Catchment Control at Mangatu, New Zealand. *Environment and History*, 9(3), 333-359.
- Corbella, S., & Stretch, D. D. (2012). Geotextile sand filled containers as coastal defence: South African experience. *Geotextiles and Geomembranes*, 35(0), 120-130. doi: <http://dx.doi.org/10.1016/j.geotexmem.2012.09.004>
- Costanza, R., Low, B. S., Ostrom, E., & Wilson, J. (Eds.). (2001). *Institutions, Ecosystems, and Sustainability*. Boca Raton, FL: Lewis Publishers.
- Coumou, D., & Rahmstorf, S. (2012). A decade of weather extremes. *Nature Clim. Change*, 2(7), 491-496.
- Cowan, J. (1922). *The Old Frontier: Te Awamutu, the story of the Waipa Valley: the missionary, the soldier, the pioneer farmer, early coloization, the war in Waikato, life on the Maori border and later-day settlement*. Te Awamutu: The Waipa Post Printing and Publishing Company.
- Cracknell, A. P., & Hayes, L. (2007). *Introduction to remote sensing*. London: Taylor and Francis.
- Cram, F. (1993). *Ethics in Maori research*. Paper presented at the Proceedings of a symposium held at the Annual Conference of the New Zealand Psychological Society, University of Victoria, Wellington.
- Cram, F. (2001). The validity and integrity of Maori research. In M. Tolich (Ed.), *Research Ethics in Aotearoa New Zealand* (pp. 35-51). Auckland: Person Education
- Crate, S. A., & Nutall, M. (Eds.). (2009). *Anthropology and Climate Change: From Encounters to Actions* Walnut Creek, CA: Left Coast Press.
- Critto, A., Gallina, V., Torresan, S., Rizzi, J., Zabeo, A., Carniel, S., . . . Marcomini, A. (2012). *Coastal erosion impacts under climate change scenarios at the regional scale in the North Adriatic Sea*. Paper presented at the EGU General Assembly Conference Abstracts.
- Crona, B., Wutich, A., Brewis, A., & Gartin, M. (2013). Perceptions of climate change: Linking local and global perceptions through a cultural knowledge approach. *Climatic Change*, 1-13.
- Cronin, K., Doody, B., & Greenaway, A. (2011). Degrees of Possibility: Igniting Social Knowledge around Climate Change Workshop Report. In R. Nattage (Ed.), (pp. 76). Wellington, NZ: New Zealand Climate Change Centre.
- CSIRO. (2013). Complexity in social-ecological systems. Retrieved 18.01.2013, 2013, from <http://www.csiro.au/science/ComplexSocial-EcologicalSystems>
- Cummins, S., Curtis, S., Diez-Roux, A. V., & Macintyre, S. (2007). Understanding and representing 'place' in health research: A relational approach. *Social Science & Medicine*, 65(9), 1825-1838.
- Daft, R. L. (2008). *Organization Theory and Design* (Vol. 10). Mason, OH: Western Cengage Learning.
- Dahm, J., Jenks, G., & Bergin, D. (2005). Community-based Dune Management for the Mitigation of Coastal Hazards and Climate Change Effects: A Guide for Local Authorities. Whakatane, NZ: Bay of Plenty Regional Council.
- Davenport, C. (2014, Feb. 5, 2014). White House Announces 7 Regional Climate

- Hubs, *The New York Times*. Retrieved from <http://www.nytimes.com/2014/02/06/us/next-phase-of-obamas-executive-push-climate-hubs.html? r=0>
- Davidson, J. (1984). *The Prehistory of New Zealand*. Auckland, NZ: Longman Paul.
- Davies, C. A. (2008). *Reflexive Ethnography: A Guide to Researching Selves and Others*. New York: Routledge.
- Davison, I. (2011, 28.12.2011). Holiday poll rates north the best, *The New Zealand Herald*. Retrieved from http://www.nzherald.co.nz/coromandel/news/article.cfm?l_id=123&objectid=10775557
- Davoudi, S. (2010). *Planning as an academic discipline* Paper presented at the BTH Swedish School of Planning Advisory Board Meeting [http://www.bth.se/tks/fp.nsf/bilagor/Presentation_SD_pdf/\\$file/PresentationSD.pdf](http://www.bth.se/tks/fp.nsf/bilagor/Presentation_SD_pdf/$file/PresentationSD.pdf)
- Davoudi, S., Brooks, E., & Mehmood, A. (2013). Evolutionary Resilience and Strategies for Climate Adaptation. *Planning Practice & Research*, 28(3), 307-322. doi: 10.1080/02697459.2013.787695
- Davoudi, S., Crawford, J., & Mehmood, A. (2010). Climate Change and Spatial Planning Response. In S. Davoudi, J. Crawford & A. Mehmood (Eds.), *Planning for Climate Change: Strategies for Mitigation and Adaptation for Spatial Planners* (pp. 7-19). London: Earthscan
- de Lange, W., & McSaveney, E. (2012). Tsunamis - New Zealand's underrated hazard. Retrieved 26.04.2013, 2013, from <http://www.teara.govt.nz/en/map/6213/travel-times-1960-chilean-tsunami>
- Department for Communities and Local Government. (2012). Planning, building and the environment. Retrieved 03.09.2012, 2012, from <http://www.communities.gov.uk/planningandbuilding/sustainability/>
- Department of Climate Change. (2009). Climate Change Risks to Australia's Coast: A First Pass National Assessment (pp. 172). Canberra, ACT.
- Department of Conservation. (2010). *New Zealand Coastal Policy Statement*. Wellington, NZ: Department of Conservation.
- Department of Internal Affairs. (2011). Councils' Roles and Functions. Retrieved 20.09.2013, 2013, from <http://www.dia.govt.nz/Policy-Advice-Areas---Local-Government-Policy---Better-Local-Government-brochure>
- Deputy Chief Executive Environment Waikato. (2011). Report to Council - Decision Required *Waikato Regional Council Brand Name*. Hamilton: Environment Waikato.
- Dessai, S., Hulme, M., Lempert, R., & Pielke Jr, R. (2009). Do we need better predictions to adapt to a changing climate? *EOS*, 90(13), 111-112.
- DiMento, J. F., & Doughman, P. M. (Eds.). (2007). *Climate Change: What it means for us, our children, and our grandchildren*. Cambridge, MA: The MIT Press.
- Dovers, S. (2009). Normalizing adaptation. *Global Environmental Change*(19), 4-6.
- Dowling, W. C. (2011). *Ricoeur on Time and Narrative*. Notre Dame, Indiana: University of Notre Dame Press.
- Duxbury, A., Duxbury, A. C., & Sverdrup, K. A. (2002). *Fundamentals of*

- oceanography* (4th ed.). New York: McGraw-Hill.
- Dynes, R., Payn, T., Brown, H., Bryant, J., Newton, P., Snow, V., . . . Beets, P. (2010). New Zealand's land-based primary industries & climate change: Assessing adaptation through scenario-based modelling. *Climate Change Adaptation in New Zealand: Future Scenarios and Some Sectoral Perspectives*. NZ Climate Change Centre, Wellington, NZ, 44-55.
- Eakin, H., & Wehbe, M. B. (2009). Linking local vulnerability to system sustainability in a resilience framework: Two cases from Latin America *Climatic Change*, 93, 355-377.
- Eakin, H., Winkels, A., & Sendzimir, J. (2009). Nested vulnerability: exploring cross-scale linkages and vulnerability teleconnections in Mexican and Vietnamese coffee systems. *Environmental Science & Policy*, 12(4), 398-412.
- Easterbrook, D. J. (1998). *Surface Processes and Landforms* (2 ed.). Upper Saddle River, NJ: Prentice Hall.
- Eiser, J. R., Bostrom, A., Burton, I., Johnston, D., McClure, J., Paton, D., . . . White, M. P. (2012). Risk interpretation and action: A conceptual framework for responses to natural hazards. *International Journal of Disaster Risk Reduction*.
- Ekstrom, J. A., Moser, S. C., & Torn, M. (2011). Barriers to Adaptation: A Diagnostic Framework *Final Project Report*. Sacramento, CA: California Energy Commission.
- Environment Waikato. (2000). Waikato Regional Policy Statement. Hamilton: Waikato Regional Council.
- Escobar, A. (1996). Construction nature: Elements for a post-structuralist political ecology. *Futures*, 28(4), 325-343.
- ESPACE. (2005). How can local authorities stimulate & support behavioural change in response to climate change? *A report for Hampshire County Council undertaken as part of the ESPACE project September 2004 - May 2005*. London: Alexander, Ballard & Associates with Rosslyn Research Ltd.
- Etkin, D., Haque, E., Bellisario, L., & Burton, I. (2004). An assessment of natural hazards and disasters in Canada *The Canadian natural hazards assesment project* Ottawa: Public safety and emergency preparedness Candada and environment Canada.
- European Commission. (2013). *Questions and Answers: EU strategy on adaptation to climate change*. (MEMO/13/334). Brussels: European Union Retrieved from [http://europa.eu/rapid/press-release MEMO-13-334 en.htm](http://europa.eu/rapid/press-release_MEMO-13-334_en.htm).
- European Environment Agency. (2007). Climate change: the cost of inaction and the cost of adaptation (Vol. 13). Copenhagen.
- Evers, H.-D., & Wall, C. (2006). Knowledge Loss: Managing Local Knowledge in Rural Uzbekistan. *MPRA Paper - University Library of Munich*(7565).
- EW. (2002). Coromandel Beaches: Coastal Hazards and Development. Setback Recommendations *EW Technical Report 02/06*. Hamilton: Environment Waikato.
- EW. (2006). Buffalo Beach Coastal Erosion Management Strategy. In i. a. w. E. L. a. C. Beca Carter Hollings & Ferner Ltd (Ed.), (2006/20 ed.). Hamilton, NZ: Environment Waikato.

- EW. (2009). Peninsula Project. Retrieved 05.05.2010, 2010, from <http://www.ew.govt.nz/projects/Peninsula-Project/>
- EW, & TCDC. (2003). Thames Coast Flood Risk Assessment. Hamilton: Regional and Local Council.
- Fabricius, C., & Koch, E. (Eds.). (2004). *Rights, Resources and Rural Development: Community-Based Natural Resource Management in Southern Africa*. London: Earthscan.
- Fabry, V. J., Seibel, B. A., Feely, R. A., & Orr, J. C. (2008). Impacts of ocean acidification on marine fauna and ecosystem processes. *ICES Journal of Marine Science: Journal du Conseil*, 65(3), 414-432.
- Fairfax NZ. (2012, August 17, 2012). Plan to protect beach rock solid, *Harauki Herald*, p. 7.
- Fessenden-Raden, J., Fitchen, J. M., & Heath, J. S. (1987). Providing risk information in communities: Factors influencing what is heard and accepted. *Science, Technology, & Human Values*, 12(3/4), 94-101.
- Few, R. (2001). Researching actor power: analyzing mechanisms of interaction in negotiations over space. *Area*, 34(1), 29-38.
- Few, R., Brown, K., & Tompkins, E. L. (2007). Public participation and climate change adaptation: avoiding the illusion of inclusion *Climate Policy*, 7(1), 46-59.
- Fidelman, P. I. J., Leitch, A. M., & Nelson, D. R. (2013). Unpacking multilevel adaptation to climate change in the Great Barrier Reef, Australia. *Global Environmental Change*, 23(4), 800-812. doi: <http://dx.doi.org/10.1016/j.gloenvcha.2013.02.016>
- Field, C. B., Barros, V., Stocker, T. F., & Dahe, Q. (2012). *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation: Special Report of the Intergovernmental Panel on Climate Change*. New York: Cambridge University Press.
- Fischer, F. (1998). Beyond Empiricism: Policy Inquiry in Postpositivist Perspective. *Policy Studies Journal*, 26(1), 129-146.
- Fletcher, C. H. (2010). Hawai'i's Changing Climate: School of Ocean and Earth Science and Technology, University of Hawai'i at Manoa.
- Fletcher, C. H., Mullane, R. A., & Richmond, B. M. (1997). Beach Loss along Armored Shorelines on Oahu, Hawaiian Islands. *Journal of Coastal Research*, 13(1), 209-215.
- Flyvbjerg, B. (1998). *Rationality and power: Democracy in practice*. Chicago: University of Chicago Press.
- Flyvbjerg, B. (2001). *Making Social Science Matter: Why Social Inquiry Fails and How it Can Succeed Again*. New York: Cambridge University Press.
- Flyvbjerg, B. (2006). Five Misunderstandings About Case-Study Research. *Qualitative Inquiry*, 12(2), 219-224.
- Focus. (2012). Coromandel East Coast Beaches: Potential Impact of Projected Climate Change on Coastal Erosion over the next Century and the Review of associated Coastal Setback In B. Gibberd & J. Dahm (Eds.). Thames: Thames Coromandel District Council.
- Folke, C. (2006). Resilience: The emergence of a perspective for social-ecological systems analyses. *Global Environmental Change*, 16(3), 253-267.
- Folke, C., Carpenter, S. R., Elmqvist, T., Gunderson, L. H., Holling, C. S., &

- Walker, B. (2002). Resilience and sustainable development: Building adaptive capacity in a world of transformations. *Ambio*, 31(5), 437-440.
- Folke, C., Hahn, T., Olsson, P., & Norberg, J. (2005). Adaptive Governance of Social-Ecological Systems. *Annual Review of Environment and Resources*, 30(1), 441-473.
- Folke, C., Pritchard, L., Berkes, F., Colding, J., & Svedin, U. (2007). The problem of Fit between Ecosystems and Institutions *Ecology and Society*, 12(1).
- Ford, J., Pearce, T., Smit, B., Wandel, J., Allurut, M., Shappa, K., . . . Qrunnut, K. (2007). Reducing vulnerability to climate change in the Arctic: the case of Nunavut, Canada. *Arctic*, 150-166.
- Ford, J. D., Berrang-Ford, L., & Paterson, J. (2011). A systematic review of observed climate change adaptation in developed nations. *Climatic Change*, 106(2), 327-336. doi: 10.1007/s10584-011-0045-5
- Forester, J. (1989). *Planning in the face of power*. Berkeley and Los Angeles: University of California Press.
- Forester, J. (1993). *Critical Theory, Public Policy and Planning Practice: Toward a Critical Pragmatism*. Albany, NY: University of New York Press.
- Forester, J. (1999). *The deliberative practitioner: Encouraging participatory planning processes*. Cambridge, MA: MIT Press.
- Forsyth, T. (2003). *Critical Political Ecology*. London: Routledge.
- Forsyth, T. (2007). Political ecology and the epistemology of social justice. *Geoforum*, 39(2), 756-764.
- Forsyth, T. (2008). Political ecology and the epistemology of social justice. *Geoforum*, 39(2), 756-764.
- Foucault, M. (1972). The discourse on language. *Truth: Engagements Across Philosophical Traditions*, 315-335.
- Foucault, M. (1980). *Power/Knowledge*. New York: Pantheon Books.
- Freeman, C., & Cheyne, C. (2008). Coasts for Sale: gentrification in New Zealand. *Planning Theory and Practice*, 9(1), 33-56.
- French, P. W. (2001). *Coastal Processes, Problems and Solutions*. New York: Routledge.
- French, S. A. (1995). What Is Social Memory? *Southern Cultures*, 2(1), 9-18.
- Freudenburg, W. R., Gramling, R., & Davidson, D. J. (2008). Scientific certainty argumentation methods (SCAMs). *Sociological Inquiry*, 78, 2-38.
- Friedmann, J. (1987). *Planning in the Public Domain: From Knowledge to Action*. Chichester, UK: Princeton University Press.
- Friedmann, J. (1998). Planning Theory revisited. *European Planning Studies*, 6(3), 245-254.
- Friedmann, J. (2008). The Uses of Planning Theory: A Bibliographic Essay. *Journal of Planning Education and Research*, 28(2), 247-257. doi: 10.1177/0739456x08325220
- Funtowicz, S. O., & Ravetz, J. R. (1993). Science for the post-normal age. *Futures*, 25(7), 739-755. doi: [http://dx.doi.org/10.1016/0016-3287\(93\)90022-L](http://dx.doi.org/10.1016/0016-3287(93)90022-L)
- Funtowicz, S. O., & Ravetz, J. R. (1994). Uncertainty, complexity and post-normal science. *Environmental toxicology and chemistry*, 13(12), 1881-1885.
- Füssel, H. M. (2007). Adaptation planning for climate change: concepts,

- assessment approaches, and key lessons. *Sustainability Science*, 2(2), 265-275. doi: 10.1007/s11625-007-0032-y
- Füssel, H. M., & Klein, R. J. T. (2004). Conceptual frameworks of adaptation to climate change and their applicability to human health Potsdam, GER: Potsdam Institute for Climate Impact Research.
- Gallopin, G. C. (2006). Linkages between vulnerability, resilience, and adaptive capacity. *Global Environmental Change*, 16(3), 293-303.
- Gardiner, S. M. (2010). Ethics and climate change: an introduction. *Wiley Interdisciplinary Reviews: Climate Change*, 1(1), 54-66. doi: 10.1002/wcc.16
- Gardiner, S. M., & Hartzell-Nichols, L. (2012). Ethics and Global Climate Change. *Nature Education Knowledge*, 3(10), 5.
- Garrett, B. L. (2012). *Place Hacking: Tales of Urban Exploring*. (Doctor of Philosophy), University of London, London.
- Gecas, V., & Burke, P. (1995). Self and Identity. In K. Cook, G. A. Fine & J. House (Eds.), *Sociological Perspectives on Social Psychology* (pp. 41-61). Boston, MA: Allyn and Bacon
- Gee, J. P. (2014). *An Introduction to Discourse Analysis* Oxon, UK: Routledge.
- Geertz, C. (1973). *The Interpretation of Cultures*. New York: Basic Books.
- Geertz, C. (1983). *Local Knowledge: Further Essays in Interpretive Anthropology*. New York: Basic Books.
- GeoNames. (2013). Thames, New Zealand. Retrieved 21.02.2013, 2013
- Gergen, K. J., & Gergen, M. M. (1986). Narrative form and the construction of psychological science In T. R. Sarbin (Ed.), *Narrative Psychology: The Storied Nature of Human Conduct* New York: Praeger
- Gerrig, R. J., & Egidi, G. (2003). Cognitive Psychological Foundations of Narrative Experiences In D. Herman (Ed.), *Narrative Theory and the Cognitive Sciences* (pp. 33-55). Stanford: CSLI Publications
- Gibson, J. J. (1979). *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.
- Gibson, J. J. (Ed.). (1982). *Reasons for Realism: Selected Essays of James J. Gibson*. Hillsdale, NJ: Lawrence Erlbaum.
- Giddens, A. (1990). *The Consequences of Modernity*. Cambridge, UK: Polity Press.
- Giddens, A. (1991). *Modernity and Self Identity: Self and Society in the Late Modern Age*. Cambridge, UK: Polity Press.
- Giddens, A. (2009). *The Politics of Climate Change*. Cambridge: Polity.
- Gilbert, E. (2005). Common cents: situating money in time and place. *Econ. Soc.*, 34(3), 357-388.
- Glantz, M. H. (2003). *Climate Affairs: A Primer*. Washington, DC: Island Press.
- Glantz, M. H. (Ed.). (1999). *Creeping Environmental Problems and Sustainable Development in the Aral Sea Basin*. Cambridge, UK: Cambridge University Press.
- Glaser, B. G., & Strauss, A. L. (1999). *The discovery of grounded theory: strategies for qualitative research*. New York: Aldine de Gruyter.
- Glavovic, B. C. (2013). The 2004 Manawatu floods, New Zealand: Integrating Flood Risk Reduction and Climate Change Adaptation. In B. C. Glavovic & G. Smith (Eds.), *Adapting to Climate Change: Lessons from Natural*

- Hazards Planning*: Springer, in print
- Glavovic, B. C., & Kelly, P. M. (2013). *Towards a reflexive approach to coastal adaptation*.
- Glavovic, B. C., Saunders, W., & Becker, J. (2010). Land-use planning for natural hazards in New Zealand: the setting, barriers, 'burning issues' and priority actions. *Natural Hazards*, 54(3), 679-706. doi: 10.1007/s11069-009-9494-9
- Glynn, T. J. (1981). Psychological sense of community: Measurement and application. *Human Relations*, 34(7), 789-818.
- Gorz, A. (1993). Political Ecology: Expertocracy versus Self-Limitation. *New Left Review*, 201, 45-63.
- Gorz, A. (2010). *Ecologica*. London: Seagull Books.
- Government Accountability Office (GAO). (2009). Climate Change Adaptation: Strategic Federal Planning Could Help Government Officials Make More Informed Decisions Washington, DC: Government Accounting Office.
- Greenberg, J. B., & Park, T. K. (1994). Political Ecology. *Journal of Political Ecology*, 1, 1-12.
- Greenhouse Policy Coalition. (2010). Survey shows climate change ranks lowest among issues and concerns about its costs have risen. *News Releases*. Retrieved 22.01.2014, 2014, from http://gpcnz.co.nz/Site/News_Releases/GPC_survey_2010.aspx
- Grenz, S. (1996). *A primer on postmodernism*. Grand Rapids, Mich.: William B. Eerdmans Pub. Co.
- Gunder, M., & Hillier, J. (2009). *Planning in Ten Words or Less: A Lacanian Entanglement with Spatial Planning*. Surrey, UK: Ashgate.
- Gunderson, L. H., & Holling, C. S. (Eds.). (2002). *Panarchy: understanding transformations in human and natural systems*. Washington, DC: Island Press.
- Gurran, N. (2008). The Turning Tide: Amenity Migration in Coastal Australia. *International Planning Studies*, 13(4), 391-414. doi: 10.1080/13563470802519055
- Gurran, N., & Blakely, E. (2007). Suffer a Sea Change? Contrasting perspectives towards urban policy and migration in coastal Australia. *Australian Geographer*, 38(1), 113-131. doi: 10.1080/00049180601175899
- Gurran, N., Squires, C., & Blakely, E. (2005). Meeting the Sea Change Challenge: Sea Change Communities in Coastal Australia (Vol. 1). Sydney: National Sea Change Taskforce.
- Gurran, N., Squires, C., & Blakely, E. (2006). Meeting the Sea Change Challenge: Best Practice Models of Local and Regional Planning for Sea Change Communities in Coastal Australia (Vol. 2). Sydney: National Sea Change Taskforce.
- Haasnoot, M., Kwakkel, J. H., Walker, W. E., & ter Maat, J. (2013). Dynamic adaptive policy pathways: A method for crafting robust decisions for a deeply uncertain world. *Global Environmental Change*, 23(2), 485-498. doi: <http://dx.doi.org/10.1016/j.gloenvcha.2012.12.006>
- Habermas, J. (1992). *Postmetaphysical Thinking*. Cambridge, MA: MIT Press.
- Hacking, I. (1994). Memero-politics, trauma and the soul *History of the Human*

- Sciences*, 7(2), 29-52.
- Hacking, I. (1995). *Rewriting the Soul: Multiple Personality and the Sciences of Memory*. Princeton, NJ: Princeton University Press.
- Haggerty, J. H. (2007). "I'm not a greenie but...": Environmentality, eco-populism and governance in New Zealand Experiences from the Southland whitebait fishery. *Journal of Rural Studies*, 23(2), 222-237. doi: <http://dx.doi.org/10.1016/j.jrurstud.2006.11.002>
- Hajer, M. (1993). Discourse Coalitions and the Institutionalization of Practice: The Case of Acid Rain in Britain. In F. Fischer & J. Forester (Eds.), *The Argumantative Turn* (pp. 43-76). Durham, NC: Duke University Press
- Hall, C. M., & Higham, J. E. (Eds.). (2005). *Tourism, recreation, and climate change*. Clevedon, UK: Channel View Publications.
- Halpern, B. S., Walbridge, S., Selkoe, K. A., Kappel, C. V., Micheli, F., D'Agrosa, C., . . . Fox, H. E. (2008). A global map of human impact on marine ecosystems. *Science*, 319(5865), 948-952.
- Hammersley, M., & Atkinson, P. (1983). *Ethnography: Principles in practice*. London: Tavistock.
- Hammersley, M., & Atkinson, P. (2007). *Ethnography: Principles in practice*. New York, NY: Routledge.
- Hampton, G. (2009). Narrative policy analysis and the integration of public involvement in decision making. *Policy Sciences*, 42(3), 227-242. doi: 10.1007/s11077-009-9087-1
- Hansen, J., Kharecha, P., Sato, M., Ackerman, F., Hearty, P. J., Hoegh-Guldberg, O., . . . Zachos, J. C. (2012). Scientific Case for Avoiding Dangerous Climate Change to Protect Young People and Nature. *Cornell University Library, arXiv.org*.
- Hanson, J., Sato, M., Kharecha, P., Beerling, D., Berner, R., Masson-Delmotte, V., . . . Zachos, J. C. (2008). Target atmospheric CO2: Where should humanity aim? *Arxiv*, 1-20.
- Harding, J. S., Quinn, J. M., & Hickey, C. W. (2000). Effects of mining and production forestry. *New Zealand stream invertebrates: ecology and implications for management*. Christchurch, New Zealand *Limnological Society*, 230-259.
- Hardy, D. J., & Patterson, M. G. (2012). Cross-cultural environmental research in New Zealand: Insights for ecological economics research practice. *Ecological Economics*, 73(0), 75-85. doi: <http://dx.doi.org/10.1016/j.ecolecon.2011.10.022>
- Harmsworth, G. (2005). Good practice guidelines for working with tangata whenua and Māori organisations: Consolidating our learning. Palmerston North: Manaaki Whenua (Landcare Research).
- Harper, D. (2002). Talking about pictures: a case for photo elicitation. *Visual Studies*, 17(1), 13-26.
- Harper, P., Donnell, H., Morton, J., Theunissen, M., Newstalk ZB, & Davison, I. (2011, October 11, 2011). Rena spill: 'Tomorrow much worse', *New Zealand Herald*. Retrieved from http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10758195
- Harper, T. L., & Stein, S. M. (1995). Out of the postmodern abyss: preserving the rationale for liberal planning. *Journal of Planning Education and*

- Research, 14*, 233-244.
- Hart, G. (2011). Vulnerability and adaptation to sea-level rise in Auckland, New Zealand. Wellington, New Zealand: The New Zealand Climate Change Research Institute, Victoria University of Wellington.
- Hartley, J. (2004). Case Study Research. In C. Cassell & G. Symon (Eds.), *Essential Guide to Qualitative Methods in Organizational Research*. London: Sage
- Haughton, G., Allmendinger, P., Counsell, D., & Vigar, G. (2010). *The New Spatial Planning*. Oxon, UK: Routledge.
- Head, L. (2010). Cultural ecology: adaptation - retrofitting a concept? *Progress in Human Geography, 34*(2), 234-242.
- Headland, T. N., Pike, K. L., & Harris, M. (1990). *Emics and etics: The insider/outsider debate* (Vol. 9). Newbury Park, CA: Sage
- Healey, P. (1996). The communicative turn in planning theory and its implications for spatial strategy formation. *Environment and planning B, 23*, 217-234.
- Healey, P. (2003). Collaborative planning in perspective. *Planning Theory, 2*(2), 101-123.
- Healey, P. (2006). *Collaborative planning: shaping places in fragmented societies* (2nd ed.). Basingstoke, Hampshire New York: Palgrave Macmillan.
- Healey, P. (2007). Re-thinking Key Dimensions of Strategic Spatial Planning: Sustainability and Complexity. In G. De Roo & G. Porter (Eds.), *Fuzzy Planning: The Role of Actors in a Fuzzy Governance Environment* (pp. 21-42). Aldershot, UK: Ashgate Publishing Ltd
- Healy, T. (Ed.). (2003). *Urgent need to protect New Zealand's coastal landscapes* (Vol. 60).
- Hegger, D., Lamers, M., Van Zeijl-Rozema, A., & Dieperink, C. (2012). Conceptualising joint knowledge production in regional climate change adaptation projects: success conditions and levers for action. *Environmental Science & Policy, 18*(0), 52-65. doi: <http://dx.doi.org/10.1016/j.envsci.2012.01.002>
- Herbert, S. (2000). For Ethnography. *Progress in Human Geography, 24*(4), 550-568. doi: 10.1191/030913200100189102
- Herrigel, E. (1988). *Zen in the Art of Archery*. New York: Vintage Books.
- Hewitt, J. (2007). Ethical Components of Researcher-Researched Relationships in Qualitative Interviewing. *Qualitative Health Research, 17*(8), 1149-1159. doi: 10.1177/1049732307308305
- Hinkel, J. (2011). Indicators of vulnerability and adaptive capacity: Towards a clarification of the science-policy interface. *Global Environmental Change, 21*, 198-208.
- Hoch, C. (1992). The paradox of power in planning practice. *Journal of Planning Education and Research*(12), 206-215.
- Høeg, P. (2005). *Miss Smilla's Feeling for Snow*. London: Vintage Books.
- Holdren, J. P. (2008). Science and Technology for Sustainable Well-Being. *Science, 319*(5862), 424-434. doi: 10.1126/science.1153386
- Holiday Houses. (2013). Absolute Waterfront Splendour Town Centre. Auckland, NZ: Trade Me Ltd.
- Holland, J. H. (2006). Studying Complex Adaptive Systems. *Journal of Systems Science and Complexity, 19*(1), 1-8.

- Hook, G. R. (2009). "Warrior genes" and the disease of being Māori. *MAI Review, Target article*, 2, 11.
- Hopper Developments Ltd. (2011). Whitianga Waterways. *Live The Lifestyle Of Your Dreams*. Retrieved 22.03.2013, 2013, from <http://www.whitiangawaterways.co.nz/>
- HorizonPoll. (2012, 04.08.2012). 22% slump in climate change concern. 03.08.2012. Retrieved 03.08.2012, 2012, from <http://www.horizonpoll.co.nz/page/242/kiwis-who-th>
- Houkamau, C. A. (2010). Identity construction and reconstruction: the role of socio-historical contexts in shaping Māori woman's identity. *Social Identities: Journal for the Study of Race, Nation and Culture*, 16(2), 179-196.
- Hovell, J., & Ngapo, M. (2008). A History Report (pp. 383). Harataunga/Kennedy Bay: Ngati Porou ki Hauraki Trust.
- Howard, J. (2010). Climate Change Mitigation and Adaptation in Developed Nations: A Critical Perspective on the Adaptation Turn in Urban Climate Planning. In S. Davoudi, J. Crawford & A. Mehmood (Eds.), *Planning for Climate Change: Strategies for Mitigation and Adaptation for Spatial Planners* London: Earthscan
- Howden, S. M., Soussana, J.-F., Tubiello, F. N., Chhetri, N., Dunlop, M., & Meinke, H. (2007). Adapting agriculture to climate change. *Proceedings of the National Academy of Sciences*, 104(50), 19691-19696. doi: 10.1073/pnas.0701890104
- Hulme, M. (2009). *Why We Disagree About Climate Change*. Cambridge, UK: Cambridge University Press.
- Hulme, M., Adger, W. N., Dessai, S., Goulden, M., Lorenzoni, I., Nelson, D., . . . Wreford, A. (2007). Limits and barriers to adaptation: four propositions. *Tyndall Briefing Note 20*, 1-7.
- Hunter, P., Burkitt, Z., & Trangmar, B. (2010). Local government adapting to climate change: Managing infrastructure, protecting resources, & supporting communities. In R. A. C. Nottage, D. Wratt, J. F. Bornman & F. Jones (Eds.), *Climate Change adaptation in New Zealand: Future scenarios and some sectoral perspectives* Wellington, NZ: New Zealand Climate Change Centre
- Huntington, H. P. (2002). Human Understanding and Understanding Humans in the Arctic System. In I. Krupnik & D. Jolly (Eds.), *The Earth is Faster Now. Indigenous Observations of Arctic Environmental Change* (pp. 384). Fairbanks, Alaska: Arctic Research Consortium of the United States
- Hurlimann, A. C., & March, A. P. (2012). The role of spatial planning in adapting to climate change. *Wiley Interdisciplinary Reviews: Climate Change*, 3(5), 477-488. doi: 10.1002/wcc.183
- Huxley, M., & Yiftachel, O. (2000). New Paradigm or Old Myopia? Unsettling the Communicative Turn in Planning Theory. *Journal of Planning Education and Research*, 19, 101-110.
- Ingold, T. (2002). Culture and the perception of the environment. In E. Croll & D. Parkin (Eds.), *Bush Base: Culture, Environment and Development* (pp. 39-56). New York: Routledge
- Innes, J. E., & Booher, D. E. (2010). *Planning with complexity: an introduction to*

- collaborative rationality for public policy*: Routledge.
- IPCC. (1990). First Assessment Report In I. P. o. C. Change (Ed.). Geneva, CH: Intergovernmental Panel on Climate Change.
- IPCC. (1996). IPCC Second Assessment: Climate Change 1995. Cambridge: Intergovernmental Panel on Climate Change.
- IPCC. (2001a). Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: International Panel on Climate Change.
- IPCC. (2001b). Third Assessment Report. Cambridge: Intergovernmental Panel on Climate Change.
- IPCC. (2007a). Climate Change 2007: Climate Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Intergovernmental Panel on Climate Change Fourth Assessment Report. Geneva, CH: Intergovernmental Panel on Climate Change.
- IPCC. (2007b). Climate change 2007a: Synthesis report. Summary for policy makers. In I. P. o. C. Change (Ed.). Geneva: IPCC Secretariat.
- IPCC. (2007c). Climate Change 2007b, Working Group III: Mitigation. In I. P. o. C. Change (Ed.). Geneva.
- IPCC. (2007d). Fourth Assessment Report. Geneva, CH: Intergovernmental Panel on Climate Change.
- IPENZ. (2012). A Safer New Zealand: Reducing our Exposure to Natural Hazards (Vol. October 2012). Wellington: The Institution of Professional Engineers New Zealand Incorporated.
- IUCN. (2013). IUCN WCPA'S Wilderness Specialist Group. Retrieved 10.09.2013, 2013, from http://www.iucn.org/about/work/programmes/gpap_home/gpap_biodiversity/gpap_wcpabiodiv/gpap_wilderness/
- Jackson, J. B. (2008). Ecological extinction and evolution in the brave new ocean. *Proceedings of the National Academy of Sciences*, 105(Supplement 1), 11458-11465.
- Jackson, J. B., Kirby, M. X., Berger, W. H., Bjorndal, K. A., Botsford, L. W., Bourque, B. J., . . . Estes, J. A. (2001). Historical overfishing and the recent collapse of coastal ecosystems. *Science*, 293(5530), 629-637.
- James, S. (2010). Three wise monkeys at Barcelona Beach. Retrieved 18.05.2013, 2013, from <http://www.flickr.com/photos/bearpark/4376859324/>
- Jentoft, S. (2007). Limits of governability: Institutional implications for fisheries and coastal governance. *Marine Policy*, 31(4), 360-370.
- Jessop, B. (2000). The crisis of the national spatio-temporal fix and the ecological dominance of globalization. *International Journal of Urban and Regional Research*, 24, 323-360.
- Jones, A., & Camille, G. (1992). Radical feminism in New Zealand: from Piha to Newtown. In R. Du Plessis & P. Bunkle (Eds.), *Feminist voices: women's studies texts for Aotearoa/New Zealand*. Auckland: Oxford University Press
- Jones, M. D., & McBeth, M. K. (2010). A Narrative Policy Framework: Clear Enough to Be Wrong? *Policy Studies Journal*, 38(2), 329-353.

- Jones, R. (2010). A risk management approach to climate change adaptation. In R. A. C. Nottage, D. S. Wratt, J. F. Bornman & K. Jones (Eds.), *Climate Change Adaptation in New Zealand: Future Scenarios and Some Sectoral Perspectives* (pp. 10-25). Wellington: New Zealand Climate Change Centre
- Jones, R. N. (2001). An environmental risk assessment/management framework for climate change impact assessments. *Natural Hazards*, 23(2-3), 197-230.
- Kabat, P., van Vierssen, W., Veraart, J., Vellinga, P., & Aerts, J. (2005). Climate proofing the Netherlands. *Nature*, 438(7066), 283-284.
- Kahan, D. (2010). Fixing the communications failure. *Nature*, 463(7279), 296-297.
- Kahan, D., & Braman, D. (2006). Cultural cognition and public policy. *Yale Law & Policy Review*, 24, 147-170.
- Kaplan, T. (1997). *Crazy for Democracy: Women in Grassroots Movements*. New York: Routledge.
- Kelly, P. M., & Adger, W. N. (2000). Theory and practice in assessing vulnerability to climate change and facilitating adaptation. *Climate Change*, 47(4), 325-352.
- Kelman, I., & West, J. (2009). Climate Change and Small Island Developing States: A Critical Review. *Ecological and Environmental Anthropology*, 5(1), 1-16.
- Keman, H. (1993). *Comparative Politics: New Directions in Theory and Method*. Amsterdam, NL: VU Press.
- Kilduff, M., & Mehra, A. (1997). Postmodernism and organisational research. *Academy of Management Review*, 22(2), 453-481.
- King, D. (2004). Understanding the message: Social and cultural constraints to interpreting weather generated natural hazards. *International Journal of Mass Emergencies and Disasters*, 22(1), 57-74.
- King, M. (1985). *Being Pakeha*. Auckland: Hodder & Stoughton.
- King, M. (1993). *The Coromandel*. Auckland: Tandem Press.
- King, M. (2003). *The Penguin History of New Zealand*. Auckland: Penguin.
- Kirch, P. V. (2005). Archeology and Global Change: The Holocene Record. *Annual Review of Environment and Resources*, 30(1), 409-440. doi: doi:10.1146/annurev.energy.29.102403.140700
- Kirschberg, A. (2007). *Coromandel Peninsula Blueprint: Natural Hazards*. Thames, NZ: Thames Coromandel District Council.
- Klein, K. (2003). Narrative Construction, Cognitive Processing, and Health. In D. Herman (Ed.), *Narrative Theory and the Cognitive Sciences* (pp. 56-84). Stanford: CSLI Publications
- Klein, R. J. T., Nicholls, R. J., & Mimura, N. (1999). Coastal Adaptation to Climate Change: Can the IPCC Technical Guidelines be applied? *Mitigation and Adaptation Strategies for Global Change*, 4(3-4), 239-252. doi: 10.1023/a:1009681207419
- Klein, R. J. T., & Tol, R. S. J. (1997). *Adaptation to climate change Options and technologies - an overview paper* (Vol. 33). Bonn, Germany: United Nations Framework Convention on Climate Change Secretariat
- Knabb, R. D., Rhome, J. R., & Brown, D. P. (2005). *Tropical Cyclone Report* (pp.

- 43). Miami, FLA: National Hurricane Center.
- Knieling, J., & Othengrafen, F. (2009). Spatial Planning and Culture - Symbiosis for a Better Understanding of Cultural Differences in Planning Systems, Traditions and Practices. In J. Knieling & F. Othengrafen (Eds.), *Planning Cultures in Europe*. Surrey, UK: Ashgate
- Koch, T. (1998). Story telling: is it really research? *Journal of Advanced Nursing*, 28(6), 1182-1190.
- Kohler-Riessman, C. (2006). Narrative interviewing In V. Jupp (Ed.), *The Sage dictionary of social research methods*. London: Sage
- Komar, P. D., & Allan, C. J. (2008). Increasing hurricane-generated wave heights along the U.S. East Coast and their climate controls. *Journal of Coastal Research*, 24(2), 479-488.
- Kopecky, P. (2002). Te Aputa Private Historic Reserve. In H. P. T.-P. Taonga (Ed.). Wellington: Te Aputa Charitable Trust.
- Krippendorff, K. (2004). *Content Analysis* (2 ed.). Thousand Oaks, CA: Sage.
- Krupnik, I., & Jolly, D. (2002). The Earth is Faster Now: Indigenous Observations of Arctic Environmental Change. Washington, DC: Arctic Research Consortium of the United States, Fairbanks, Alaska and The Smithsonian Institution
- Kuhn, T. S. (1987). What are scientific revolutions? In L. Kruger, L. J. Daston & M. Heidelberger (Eds.), *The probabilistic revolution, Vol. 1: Ideas in history* (pp. 7-22). Cambridge, MA: MIT Press
- Kulatunga, U. (2010). Impact of culture towards disaster risk reduction. *International Journal of Strategic Property Management*, 14(4), 304-313.
- Lach, D., Rayner, S., & Ingram, H. (2005). Taming the waters: strategies to domesticate the wicked problems of water resource management. *International Journal of Water*, 3(1), 1-17.
- Lahsen, M. (2008). Experiences of modernity in the greenhouse: a cultural analysis of a physicist 'trio' supporting the backlash against global warming. *Global Environmental Change*, 18, 204-219.
- Lane, M. B. (2005). Public Participation in Planning: an intellectual history. *Australian Geographer*, 36(3), 283-299. doi: 10.1080/00049180500325694
- Latour, B. (1998). To modernize or to ecologize? That's the question. In N. Castree & B. Willems-Braun (Eds.), *Remaking Reality: Nature at the Millenium* (pp. 221-242). London and New York: Routledge
- Lawler, S. (2002). Narrative in Social Research. In T. May (Ed.), *Qualitative Research in Action* (pp. 242-258). London: Sage
- Lawrence, J., Sullivan, F., Lash, A., Ide, G., Cameron, C., & McGlinchey, L. (2013). Adapting to changing climate risk by local government in New Zealand: institutional practice barriers and enablers. *Local Environment*, 1-23. doi: 10.1080/13549839.2013.839643
- Lebel, L. (2012). Local knowledge and adaptation to climate change in natural resource-based societies of the Asia-Pacific. *Mitigation and Adaptation Strategies for Global Change*, 1-20. doi: 10.1007/s11027-012-9407-1
- Lee, A. L. (1950). *Whitianga* (4 ed.). Auckland: Abel Dykes.
- Leigh, J. (2013). A tale of the unexpected: Managing an insider dilemma by adopting the role of outsider in another setting. *Qualitative Research*.

- Leiserowitz, A. (2006a). Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Climatic Change*, 77(1), 45-72.
- Leiserowitz, A. (2006b). Climate change risk perception and policy preferences: the role of affect, imagery, and values *Climatic Change*, 77(1), 45-72.
- Let's go. (2011). The northern tip overview. 2011, from http://www.lets-go.com/2051-coromandel_peninsula-travel-guides-the_northern_tip-d
- Levia, D. F. (1998). Farmland conversion and residential development in North Central Massachusetts. *Land Degradation & Development*, 9(2), 123-130. doi: 10.1002/(sici)1099-145x(199803/04)9:2<123::aid-ldr282>3.0.co;2-o
- Levin, K., Cashore, B., Bernstein, S., & Auld, G. (2012). Overcoming the tragedy of super wicked problems: constraining our future selves to ameliorate global climate change. *Policy Sciences*, 45, 1-30.
- Lewis, J. (2003). Design Issues. In J. Ritchie & J. Lewis (Eds.), *Qualitative Research Practice* (pp. 47-76). London: Sage
- Local Government Act (2002).
- Lifton, R. (1993). *The Protean Self: Human Resiliency in an Age of Fragmentation*. New York: Basic Books.
- Lim, B., Spanger-Siegfried, E., Burton, I., Malone, E., & Huq, S. (Eds.). (2004). *Adaptation Policy Frameworks for Climate Change: Developing Strategies, Policies and Measures*. Cambridge: United Nations Development Programme.
- Lindblom, C. E. (1959). The science of "muddling through". *Public Administration Rev*, 19, 79-88.
- Lipset, D. (2011). The tides: masculinity and climate change in coastal Papua New Guinea. *Journal of the Royal Anthropological Institute*, 17(1), 20-43. doi: 10.1111/j.1467-9655.2010.01667.x
- Lloyd, M. G., Peel, D., & Duck, R. W. (2013). Towards a social-ecological resilience framework for coastal planning. *Land Use Policy*, 30(1), 925-933. doi: <http://dx.doi.org/10.1016/j.landusepol.2012.06.012>
- Lorenzoni, I., Nicholson-Cole, S., & Whitmarsh, L. (2007). Barriers perceived to engaging with climate change among the UK public and their policy implications. *Global Environmental Change*, 17(3&4), 445-459.
- Lorenzoni, I., & Pidgeon, N. (2006). Public Views on Climate Change: European and USA Perspectives. *Climatic Change*, 77(1), 73-95. doi: 10.1007/s10584-006-9072-z
- Lotze, H. K., Lenihan, H. S., Bourque, B. J., Bradbury, R. H., Cooke, R. G., Kay, M. C., . . . Jackson, J. B. C. (2006). Depletion, Degradation, and Recovery Potential of Estuaries and Coastal Seas. *Science*, 312(5781), 1806-1809. doi: 10.1126/science.1128035
- Lowe, A., Foster, J., & Winkelmann, S. (2009). *Asking the Climate Question: Lessons Learned in Effective Adaptation from Urban Leaders Partners*. Washington, DC: Center for Clean Air Policy.
- Ludwig, D. (2001). The Era of Mangement Is Over. *Ecosystems*, 4, 758-764.
- Ludwig, F., Kabat, P., van Schaik, H., & van der Valk, M. (Eds.). (2009). *Climate change adaptation in the water sector*. London: Earthscan.
- Lukes, S. (1977). *Essays in social theory*. New York: Columbia University Press.
- M'Gonigle, R. M. (1999). Ecological economis and political ecology: towards a

- necessary synthesis *Ecological Economics*, 28, 11-26.
- MAF. (2008). Climate Change. 2009, from <http://www.maf.govt.nz/climatechange/>
- MAF. (2010). Māori and climate change. *About Climate Change*. Retrieved 04.04.2010, 2010, from <http://www.maf.govt.nz/climatechange/about/1-4-maori.htm>
- Mahon, R., McConney, P., & Roy, R. N. (2008). Governing fisheries as complex adaptive systems. *Marine Policy*, 32(1), 104-112.
- Maibach, E. W., Roser-Renouf, C., & Leiserowitz, A. (2008). Communication and Marketing As Climate Change-Intervention Assets: A Public Health Perspective. *American Journal of Preventive Medicine*, 35(5), 488-500. doi: <http://dx.doi.org/10.1016/j.amepre.2008.08.016>
- Malloy, C. (Writer). (2010). 180° South: Conquerers of the Useless. In T. Lynch (Producer). USA.
- Mandelbaum, S. (1996). The talk of the community. In S. Mandelbaum, L. Mazza & R. Burchell (Eds.), *Explorations in Planning Theory*. New Brunswick, NJ: Centre for Urban Policy Research
- Manning, M., Chapman, R., Hales, S., Howden-Chapman, P., King, D., Kjellstrom, T., . . . Lindsay, G. (2011). Synthesis: Community vulnerability, resilience and adaptation to climate change in New Zealand. In D. Frame (Ed.). Wellington, NZ: The New Zealand Climate Change Research Institute, Victoria University of Wellington.
- māori.org.nz. (2004). Main Māori site on the Net. Retrieved 10.04.2010, 2010, from <http://www.maori.org.nz/>
- Marshall, A., Robinson, L., & Allen Owens, M. (2011). Coastal construction trends in response to coastal erosion: an opportunity for adaptation. *Journal of Coastal Conservation*, 15(1), 61-72. doi: 10.1007/s11852-010-0120-5
- Martin, P. Y., & Turner, B. A. (1986). Grounded theory and organizational research. *The Journal of Applied Behavioral Science*, 22(2), 141-157.
- Martinez-Alier, J. (2002). *The environmentalism of the poor: a study of ecological conflicts and valuation*. Cheltenham: Edward Elgar.
- Marx, S. M., Weber, E. U., Orlove, B. S., Leiserowitz, A., Krantz, D. H., Roncoli, C., & Phillips, J. (2007). Communication and mental processes: Experiential and analytic processing of uncertain climate information. *Global Environmental Change*, 17(1), 47-58. doi: <http://dx.doi.org/10.1016/j.gloenvcha.2006.10.004>
- Mawokomatanda, S. (2010). Biotic Rights and Political Ecology: James Nash's Ecological Vision and Lessons from Zimbabwe (pp. 1-11). Baston, MA: Boston University.
- McCarthy, J. J., Canziani, O. F., Leary, N. A., Dokken, D. J., & White, K. S. (Eds.). (2001). *Climate Change 2001: Impacts, Adaptation & Vulnerability*. New York: Cambridge University Press.
- McCormack, F. (2010). Fish is My Daily Bread: Owning and Transacting in Maori Fisheries. *Anthropological Forum*, 20(1), 19-39. doi: 10.1080/00664670903524194
- McCright, A. M., & Dunlap, R. E. (2010). Anti-Reflexivity: the American conservative movement's success in undermining climate science and policy. *Theory, Culture & Society*, 27(2-3), 100-133.

- McCright, A. M., & Dunlap, R. E. (2011). Cool dudes: The denial of climate change among conservative white males in the United States. *Global Environmental Change, 21*(4), 1163-1172. doi: <http://dx.doi.org/10.1016/j.gloenvcha.2011.06.003>
- McGranahan, G., Balk, D., & Anderson, B. (2007). The rising tide: assessing the risks of climate change and human settlements in low elevation coastal zones. *Environment and Urbanization, 19*(1), 17-37. doi: 10.1177/0956247807076960
- McGregor, D. (2004). Coming Full Circle: Indigenous Knowledge, Environment, and Our Future. *American Indian Quarterly, 28*(3&4), 385-410.
- McIlwraith, T. (2006). Insiders and Outsiders in Ethnography. *Fieldnotes for the Anthropology of British Columbia, Canada*. Retrieved 01.02.2014, 2014, from <http://www.anthroblog.tadmilwraith.com/2006/04/19/insiders-and-outsiders-in-ethnography/>
- McKibben, B. (2007). Warning on Warming. *The New York Review of Books, 54*(4), 18.
- McLain, R. J., & Lee, R. G. (1996). Adaptive management: promises and pitfalls. *Environmental Management, 20*(4), 437-448.
- McLean, D. (2002). Development of Māori land. Christchurch, New Zealand: Lincoln University.
- McLoughlin, J. B. (1994). Center or periphery? Town planning and spatial political economy. *Environment and Planning A, 26*, 1111-1122.
- McMillan, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory. *Journal of community psychology, 14*(1), 6-23.
- McNamara, D. E., Murray, A. B., & Smith, M. D. (2011). Coastal sustainability depends on how economic and coastline responses to climate change affect each other. *Geophysical Research Letters, 38*(7).
- McNaught, C., & Lam, P. (2010). Using Wordle as a supplementary research tool. *The Qualitative Report, 15*(3), 630-643.
- McNay, L. (2000). *Gender and Agency: Reconfiguring the Subject in Feminist and Social Theory* Cambridge: Polity.
- McSweeney, K., & Coomes, T. (2011). Climate-related disaster opens a window of opportunity for rural poor in northeastern Honduras. *PNAS, 108*(13), 5203-5208.
- Meadows, D. H. (1999). *Leverage Points: Places to Intervene in a System*. Hartland, VT: The Sustainability Institute.
- Measham, T. G., Preston, B. L., Smith, T. F., Brooke, C., Gorddard, R., Withycombe, G., & Morrison, C. (2011). Adapting to climate change through local municipal planning: barriers and challenges. *Mitig Adapt Strat Glob Change*.
- Memon, P., & Cullen, R. (1992). Fishery policies and their impact on the New Zealand Maori. *Marine Resource Economics, 7*(3), 153-167.
- Meppem, T., & Bourke, S. (1999). Different ways of knowing: a communicative turn toward sustainability. *Ecological Economics, 30*(3), 389-404.
- Merriam, S. B., Johnson-Bailey, J., Lee, M.-Y., Kee, Y., Ntseane, G., & Muhamad, M. (2001). Power and positionality: Negotiating insider/outsider status within and across cultures. *International Journal of Lifelong Education, 20*(5), 405-416.

- Merrifield, M. A., Merrifield, S. T., & Mitchum, G. T. (2009). An Anomalous Recent Acceleration of Global Sea Level Rise. *Journal of Climate*, 22(21), 5772-5781.
- MFE. (2001). Climate Change Impacts in New Zealand Wellington, NZ: Ministry for the Environment.
- MFE. (2006). Your Guide to the Resource Management Act. Wellington, NZ: Ministry for the Environment.
- MFE. (2008a). Climate Change Effects and Impacts Assessment. In A. B. Mullan, D. Wratt, S. Dean, M. Hollis, S. Allan, T. Williams & G. J. Kenny (Eds.), *A Guidance Manual for Local Government in New Zealand* (Vol. 2, pp. xvii + 149). Wellington, NZ.
- MFE. (2008b). Coast Care Bay of Plenty Dune Restoration. Wellington, NZ: Ministry for the Environment.
- MFE. (2008c). Coastal Hazards and Climate Change. A Guidance Manual for Local Government in New Zealand (Vol. 2). Wellington: Ministry for the Environment.
- MFE. (2008d). Preparing for Climate Change: A guide for local government in New Zealand. Wellington: Ministry for the Environment.
- MFE. (2008e). Tauranga City Council prepares for more intense rainfall. Wellington, NZ: Ministry for the Environment.
- MFE. (2008f). Transit NZ - climate change and ther state highway network. Wellington, NZ: Ministry for the Environment.
- MFE. (2009a). Climate Change Information New Zealand. *What's happening?* Retrieved 09.01.2010, 2010, from <http://www.climatechange.govt.nz/>
- MFE. (2009b). Greenhouse gas emissions and removals. Retrieved 26.07.2013, 2013, from <http://www.mfe.govt.nz/environmental-reporting/atmosphere/greenhouse-gases/emissions.html>
- MFE. (2009c). Preparing for coastal change: A guide for local government in New Zealand (pp. 30). Wellington: Ministry for the Environment.
- MFE. (2012a). Adapting to sea level rise. Retrieved 19.06.2013, 2013, from <http://www.mfe.govt.nz/issues/climate/adaptation/sea-level-rise.html>
- MFE. (2012b). Climate change information New Zealand. *Climate change impacts and adaptation publications* Retrieved 06.05.2013, 2013, from <http://www.climatechange.govt.nz/physical-impacts-and-adaptation/publications.html>
- MFE. (2013a). Climate change information New Zealand *Doing our fair share*. Retrieved 09.11.2013, 2013, from <http://www.climatechange.govt.nz/reducing-our-emissions/targets.html>
- MFE. (2013b). National Environmental Standards. Retrieved 19.06.2013, 2013, from <http://www.mfe.govt.nz/laws/standards/>
- Mileti, D. S. (1999). *Disasters by design: a reassessment of natural hazards in the United States*. Washington, D.C.: Joseph Henry Press.
- Millenium Ecosystem Assessment. (2005). Ecosystems and human well-being: current state and trends: findings of the Condition and Trends Working Group. In R. Hassan, R. Scholes & N. Ash (Eds.), (Vol. 1). Washington, DC: MA.
- Miller, A. S. (1978). *A Planet to Choose: Value Studies in Political Ecology*. New York: Pilgrim Press.

- Ministry of Economic Development. (2013). Companies Office. Retrieved 10.04.2013, 2013, from <http://www.business.govt.nz/company-search/companydetails/4008519>
- Ministry of Education. (2010). Education Counts. *Adult literacy and numeracy in New Zealand - A regional analysis*. Retrieved 01.02.2014, 2014, from <http://www.educationcounts.govt.nz/publications/series/ALL/adult-literacy-and-numeracy-in-new-zealand-a-regional-analysis/4.-literacy-and-numeracy-by-urbanrural-profile>
- Mintzberg, H., Raisinghani, D., & Théorêt, A. (1976). The Structure of "Unstructured" Decision Processes. *Administrative Science Quarterly*, 21(2), 246-275.
- Mitchell, J. F. B., Karoly, D., Hegerl, G. C., Zwiers, F. W., Allen, M. R., & Marengo, J. (2001). Detection of Climate Change and Attribution of Causes. Geneva, CH: Intergovernmental Panel on Climate Change.
- Monin, P. (2012a). Hauraki-Coromandel places - Mercury Bay. Retrieved 26.03.2013, 2013, from <http://www.teara.govt.nz/en/hauraki-coromandel-places/page-6>
- Monin, P. (2012b). Hauraki-Coromandel places - North-east peninsula and Mercury Islands. Retrieved 26.03.2013, 2013, from <http://www.teara.govt.nz/en/hauraki-coromandel-places/page-5>
- Morton, T. A., Rabinovich, A., Marshall, D., & Bretschneider, P. (2011). The future that may (or may not) come: How framing changes responses to uncertainty in climate change communications. *Global Environmental Change*, 21(1), 103-109.
- Moser, S. C. (2005). Impact assessments and policy responses to sea-level rise in three US states: An exploration of human-dimension uncertainties. *Global Environmental Change*, 15, 353-369.
- Moser, S. C. (2006). Climate change and sea-level rise in Maine and Hawai'i: the changing tides of an issue domain *Global environmental assessments: information, and influence* (pp. 201-239). Cambridge, MA: MIT Press
- Moser, S. C. (2007). Effective Stakeholder Engagement in the Pacific RISA: Considerations in the Further Development of Regional Climate Services *Report prepared for the Pacific RISA*. Boulder, CO: National Center for Atmospheric Research.
- Moser, S. C. (2009a). Exploring the soft underbelly of adaptation decisions. In N. W. Adger, I. Lorenzoni & K. O'Brien (Eds.), *Adapting to Climate Change: Thresholds, Values, Governance*. Cambridge, UK: Cambridge University Press
- Moser, S. C. (2009b). Governance and the Art of Overcoming Barriers to Adaptation. *IHDP Update*(3), 31-36.
- Moser, S. C. (2009c). Making a difference on the ground: the challenge of demonstrating effectiveness of decision support. *Climatic Change*, 95, 11-21.
- Moser, S. C. (2010). Now more than ever: The need for more societally relevant research on vulnerability and adaptation to climate change. *Applied Geography*, 30, 464-474.
- Moser, S. C. (2011). Entering the Period of Consequences: The Explosive US Awakening to the Need for Adaptation. In J. D. Ford & L. Berrang-Ford

- (Eds.), *Climate Change Adaptation in Developed Nations*. New York: Springer
- Moser, S. C. (2012). Adaptation, mitigation, and their disharmonious discontents: an essay. *Climatic Change*, *111*(2), 165-175. doi: 10.1007/s10584-012-0398-4
- Moser, S. C. (2014). Communicating adaptation to climate change: the art and science of public engagement when climate change comes home. *Wiley Interdisciplinary Reviews: Climate Change*, n/a. doi: 10.1002/wcc.276
- Moser, S. C., & Dilling, L. (2011). Communicating Climate Change: Closing the Science-Action Gap. In J. S. Dryzek, R. B. Norgaard & D. Schlosberg (Eds.), *The Oxford Handbook of Climate Change and Society* (pp. 161-175). Cambridge, UK: Cambridge University Press
- Moser, S. C., & Ekstrom, J. A. (2010). A framework to diagnose barriers to climate change adaptation. *Proceedings of the National Academy of Sciences*, *107*(51), 22026-22031.
- Moser, S. C., Jeffress Williams, S., & Boesch, D. F. (2012). Wicked Challenges at Land's End: Managing Coastal Vulnerability Under Climate Change. *Annual Review of Environment and Resources*, *37*(1), 51-78. doi: 10.1146/annurev-environ-021611-135158
- Moser, S. C., Kaspersen, R. E., Yohe, G., & Agyeman, J. (2008). Adaptation to Climate Change in the Northeast United States: opportunities, processes, constraints. *Mitigation and Adaptation Strategies for Global Change*, *13*(5), 643-659.
- Moser, S. C., & Luers, A. L. (2008). Managing climate risks in California: the need to engage resource managers for successful adaptation to change. *Climatic Change*, *87*, 5309-5322.
- MPI. (2013). Impacts and adapting to climate change. *The costs of climate change*. Retrieved 11.02.2014, 2014, from <http://www.mpi.govt.nz/environment-natural-resources/climate-change/impacts-and-adapting-to-climate-change.aspx>
- Muldavin, J. (2009). Piers M. Blaikie: Winner of the 2009 Robert McC. Netting Award. Retrieved 13.12.2013, 2013, from <http://capeaag.wordpress.com/cape-honors/piers-m-blaikie/>
- Munich RE. (2010). Two months to Cancun climate summit / Large number of weather extremes a strong indication of climate change Retrieved 02.05.2011, 2011, from http://www.munichre.com/en/media_relations/press_releases/2010/2010_09_27_press_release.aspx
- Murphy, A. B. (2006). Enhancing geography's role in public debate *Annals of the Association of American Geographers*, *96*(1), 13.
- Murphy, A. B., de Blij, H. J., Turner, B. L., Gilmore, R. W., & Gregory, D. (2005). The role of geography in public debate *Progress in Human Geography*, *29*(165), 193.
- Myers, T. A., Maibach, E. W., Roser-Renouf, C., Akerlof, K., & Leiserowitz, A. (2012). The relationship between personal experience and belief in the reality of global warming. *Nature Clim. Change, advance online publication*.
- Nanda, S., & Warms, R. (2011). *Cultural Anthropology*. Belmont, CA:

- Wadsworth.
- NASA. (2010). GISS Surface Temperature Analysis. Retrieved 10.08.2013, 2013, from <http://data.giss.nasa.gov/gistemp/2010summer/>
- NASA. (2012). Airborne Topographic Mapper. Retrieved 08.04.2013, 2013, from <http://atm.wff.nasa.gov/>
- Nerlich, B., Koteyko, N., & Brown, B. (2010). Theory and language of climate change communication. *Wiley Interdisciplinary Reviews: Climate Change*, 1(1), 97-110.
- New Zealand Immigration Service. (2005). Summary of Terms. Retrieved 27.04.2011, 2011, from <http://glossary.immigration.govt.nz/Kiwis.htm>
- Nicholls, R. J., & Cazenave, A. (2010). Sea-Level Rise and Its Impact on Coastal Zones. *Science*, 328(5985), 1517-1520. doi: 10.1126/science.1185782
- Nielsen, J. ø., & Reenberg, A. (2010). Cultural barriers to climate change adaptation: A case study from Northern Burkina Faso. *Global Environmental Change*, 20(1), 142-152.
- Niskanen, W. A. (1991). The Soft Infrastructure of a Market Economy. *Cato Journal*, 11(2), 233-238.
- NIWA. (2007). Coastal Adaptation to Climate Change. In T. Hume (Ed.). Auckland, NZ: National Institute of Water and Atmospheric Research.
- NIWA. (2008a). Regional Impacts. Auckland: National Institute of Water and Atmospheric Research.
- NIWA. (2008b). Water and Atmosphere. In N. I. o. W. a. A. Research (Ed.), (2 ed., Vol. 16). Auckland, NZ.
- NIWA. (2010). NIWA thanks Whitianga community for their views. Retrieved 20.10.2011, 2011, from <http://www.niwa.co.nz/news/niwa-thanks-whitianga-community-their-views>
- NIWA. (2011). Preparing coastal communities for climate change Retrieved 09.09.2011, 2011, from <http://www.niwa.co.nz/our-science/coasts/publications/all/coasts-update/coasts-update-03/preparing-coastal-communities-for-climate-change>
- Nordstrom, K. F. (2000). *Beaches and dunes on developed coasts*. Cambridge, UK: Cambridge University Press.
- Norgaard, K. M. (2011). *Living in Denial: Climate Change, Emotions, and Everyday Life*. Cambridge, MA: The MIT Press.
- Norgaard, K. M. (2012). Climate Denial and the Construction of Innocence: Reproducing Transnational Environmental Privilege in the Face of Climate Change. *Race, Gender & Class*, 19(1), 80-103.
- Norgaard, R. B. (2001). The improvisation of discordant knowledges. In C. J. Cleveland, D. I. Stern & R. Costanza (Eds.), *The Economics of Nature and the Nature of Economics* (pp. 57-73). Cheltenham: Edward Elgar
- North, D. C. (1990). *Institutions, Institutional Change, and Economic Performance* Cambridge, UK: Cambridge University Press.
- Nottage, R. A. C., Wratt, D., Bornman, J. F., & Jones, F. (Eds.). (2010). *Climate change adaptation in New Zealand: Future scenarios and some sectoral perspectives*. Wellington, NZ: New Zealand Climate Change Centre.
- NZ Planning Institute. (2012). The RMA Quality Planning Resource. *Climate Change*. Retrieved 02.07.2013, 2013, from <http://www.qualityplanning.org.nz/index.php/planning-tools/climate-change>

- NZCPS. (2010). *New Zealand Coastal Policy Statement*. Wellington, NZ: Department of Conservation.
- NZPA. (2011). Govt accused of being obsessed with fossil fuel, *New Zealand Herald*. Retrieved from http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10748414
- O'Brien, K., Eriksen, S., Sygna, L., & Naess, L. O. (2006). Questioning Complacency: Climate Change Impacts, Vulnerability, and Adaptation in Norway. *AMBIO: A Journal of the Human Environment*, 35(2), 50-56. doi: 10.1579/0044-7447(2006)35[50:qccciv]2.0.co;2
- O'Brien, K., Leichenko, R. M., Kelkar, U., Venema, H., Aandahl, G., Tompkins, H., & al., e. (2004). Mapping vulnerability to multiple stressors: Climate change and globalization in India. *Global Environmental Change - Human and Policy Dimensions*, 14, 303-313.
- O'Connell, J. (2010). Shoreline Armoring Impacts and Management Along the Shores of Massachusetts and Kauai, Hawaii. In H. Shipman, M. N. Dethier, G. Gelfenbaum, K. L. Fresh & R. S. Dinicola (Eds.), *Puget Sounds Shorelines and the Impacts of Armoring - Proceedings of a State of the Science Workshop, May 2009* (pp. 65-76). Reston, VA: US Geological Survey.
- O'Connor, M. C., Cooper, J. A. G., McKenna, J., & Jackson, D. W. T. (2010). Shoreline management in a policy vacuum: A local authority perspective. *Ocean & Coastal Management*, 53(12), 769-778. doi: <http://dx.doi.org/10.1016/j.ocecoaman.2010.10.016>
- O'Neill, J. (2001). Representing people, representing nature, representing the world. *Environment and Planning C: Government and Policy*, 19(4), 483-500.
- O'Neill, S. J., & Hulme, M. (2009). An iconic approach for representing climate change. *Global Environmental Change*, 19(4), 402-410.
- O'Riordan, T., & Jordan, A. (1999). Institutions, climate change and cultural theory: towards a common analytical framework. *Global Environmental Change*, 9, 81-93.
- O'Toole, K., & Coffey, B. (2013). Exploring the Knowledge Dynamics Associated with Coastal Adaptation Planning. *Coastal Management*, 41, 561-575.
- ODPM. (2005). Planning Policy Statement 1: Delivering Sustainable Development Retrieved 03.09.2012, 2012, from http://www.communities.gov.uk/documents/planningandbuilding/pdf/planning_policystatement1.pdf
- Öhlmér, B., Olson, K., & Brehmer, B. (1998). Understanding farmers' decision making processes and improving managerial assistance. *Agricultural Economics*, 18(3), 273-290.
- Oliver-Smith, A. (2004). Theorising Vulnerability in a Globalised World: A Political Ecological Perspective. In G. Bankoff, G. Frerks & D. Hilhorst (Eds.), *Mapping Vulnerability: Disasters, Development and People*. London: Earthscan
- Onuf, N. (2007). Foreword. In M. E. Pettenger (Ed.), *The Social Construction of Climate Change: Power, Knowledge, Norms, Discourses*. Hampshire, UK: Ashgate Publishing Ltd

- Opotow, S., & Weiss, L. (2000). New Ways of Thinking about Environmentalism: Denial and the Process of Moral Exclusion in Environmental Conflict. *Journal of Social Issues*, 56(3), 475-490.
- Orchard, S. (2011). Implications of the New Zealand Coastal Policy Statement 2010 for New Zealand communities *Issues & Options Paper*. Wellington, NZ: Environment and Conservation Organisations of New Zealand (Inc.).
- Oreskes, N., & Conway, E. M. (2010). *Merchants of Doubt*. New York: Bloomsbury Press.
- Orlove, B. S., Chiang, J. C. H., & Cane, M. A. (2000). Forecasting Andean rainfall and crop yield from the influence of El Niño on Pleiades visibility. *Nature*, 403(6765), 68-71.
- Ostrom, E. (2007). A diagnostic approach for going beyond panaceas. *Proceedings of the National Academy of Sciences*, 104(39), 15181-15187.
- Owens, S. (2000). 'Engaging the public': information and deliberation in environmental policy. *Environment and Planning A*(32), 1141-1148.
- Owens, S., & Cowell, R. (2002). *Land and Limits: Interpreting Sustainability in the Planning Process*. London: Routledge.
- Owens, S., & Cowell, R. (2010). *Land and Limits: Interpreting Sustainability in the Planning Process*. London: Routledge.
- Paavola, J., & Adger, W. N. (2006). Fair adaptation to climate change. *Ecological Economics*, 56(4), 594-609. doi: 10.1016/j.ecolecon.2005.03.015
- Pahl-Wostl, C. (2009). A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes. *Global Environmental Change*, 19(3), 354-365.
- Parker, J., & Stanton, J. (Eds.). (2006). *Mythology: Myths, Legends, and Fantasies*. Cape Town: Struik Publishers.
- Building Act (2004).
- Parmesan, C., & Yohe, G. (2003). A globally coherent fingerprint of climate change impacts across natural systems. *Nature*, 421(6918), 37-42.
- Parry, M. L., Canziani, O. F., Palutikof, J. P., Linden, P. J. v. d., & Hanson, C. E. (Eds.). (2007). *Climate Change 2007: Impacts, adaptation and vulnerability. Contribution of Working Group II to the fourth assessment of the Intergovernmental Panel on Climate Change* UK: Cambridge University Press.
- Patt, A. G. (2009). Learning to crawl: how to use seasonal climate forecasts to build adaptive capacity In W. N. Adger, I. Lorenzoni & K. L. O'Brien (Eds.), *Adapting to Climate Change: Thresholds, Values, Governance* (pp. 79-95). Cambridge, UK: Cambridge University Press
- Peart, R. (2009). *Castles in the Sand - What's happening to the New Zealand coast*. Nelson, NZ: Craig Potton.
- Peet, R., Robbins, P., & Watts, M. J. (Eds.). (2011). *Global Political Ecology*. Cornwall, UK: Routledge.
- Peet, R., & Watts, M. (1996). Liberation Ecology: Development, Sustainability, and Environment in an Age of Market Triumphalism. In R. Peet & M. Watts (Eds.), *Liberation Ecologies. Environment, Development, Social Movements* (pp. 1-45). London: Routledge
- Pelling, M. (1999). The political ecology of flood hazard in urban Guyana. *Geoforum*, 30(3), 249-261.

- Pelling, M., High, C., Dearing, J., & Smith, D. (2008). Shadow spaces for social learning: a relational understanding of adaptive capacity to climate change within organisations. *Environment and Planning*, 40, 867-884.
- Pellow, D. (2003). The Architecture of Female Seclusion in West Africa. In S. M. Low & D. Lawrence-Zúñiga (Eds.), *The Anthropology of Space and Place* (pp. 160-184). Malden, MA: Blackwell
- Perkins, D. N., & Salomon, G. (1989). Are cognitive skills context-bound? *Educational researcher*, 18(1), 16-25.
- Perkins, H. C., & Thorns, D. (2006). Home away from home: the primary/second-home relationship. In N. McIntyre, D. R. Williams & K. E. McHugh (Eds.), *Multiple Dwellings and Tourism: Negotiating Place, Home and Identity* (pp. 67-81). Wallingford, Oxfordshire, UK: CABI
- Peters, B. G., & Pierre, J. (Eds.). (2006). *Handbook of Public Policy*. London: Sage.
- Peters, G. P., Andrew, R. M., Boden, T., Canadell, J. G., Ciais, P., Le Quere, C., . . . Wilson, C. (2013). The challenge to keep global warming below 2°C. *Nature Climate Change*, 3(1), 4-6.
- Peterson, G., De Leo, G. A., Hellmann, J. J., Janssen, M. A., Kinzig, A., Malcolm, J. R., . . . Tinch, R. R. T. (1997). Uncertainty, Climate Change, and Adaptive Management. *Conservation Ecology*, 1(2).
- Pettenger, M. E. (2013). *The Social Construction of Climate Change: Power Knowledge Norms Discourses*. Hampshire, UK: Ashgate Publishing.
- Pfeufer Kahn, R. (1988). The problem of power in Habermas. *Human Studies*, 11(4), 361-387.
- Phillips, J. (1996). *A man's country? The image of a New Zealand Male: A history*. Auckland, NZ: Penguin Books.
- Phillips, J. (2009, 02.03.2009). Beach culture - The Kiwi dream. Retrieved 01.05.2010, 2010, from <http://www.teara.govt.nz/en/beach-culture/5>
- PIA. (2013). What is planning? Retrieved 08.03.2013, 2013, from <http://www.planning.org.au/becomeaplanner/what-is-planning/what-is-planning>
- Pidgeon, N. (2012). Climate Change Risk Perception and Communication: Addressing a Critical Moment? *Risk Analysis*, 32(6), 951-956. doi: 10.1111/j.1539-6924.2012.01856.x
- Pidgeon, N., Kasperson, R. E., & Slovic, P. (Eds.). (2003). *The Social Amplification of Risk*. Cambridge, UK: Cambridge University Press.
- Pielke, R., Prins, G., Rayner, S., & Sarewitz, D. (2007). Lifting the taboo on adaptation. *Nature*, 445(7128), 597-598.
- Pierson, P. (2000). The Limits of Design: Explaining Institutional Origins and Change. *Governance*, 13(4), 475-499. doi: 10.1111/0952-1895.00142
- Pieters, R. G. M. (1988). *Handbook of economic psychology*. Dordrecht, NL: Kluwer.
- Pinch, S., Henry, N., Jenkins, M., & Tallman, S. (2003). From 'industrial districts' to 'knowledge clusters': a model of knowledge dissemination and competitive advantage in industrial agglomerations. *Journal of Economic Geography*, 3(4), 373-388. doi: 10.1093/jeg/lbg019
- Pink, S. (2007). *Doing visual ethnography*. London: Sage.
- Pink, S. (2008). *Mobilising Visual Ethnography: Making Routes, Making Place*

- and Making Images. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 9(3).
- plaNyC. (2013). A Stronger, More Resilient New York (pp. 430). New York: The City of New York.
- Platt, S. (2012). Reconstruction in New Zealand Post 2010-11 Christchurch Earthquakes *ReBuilDD Field Trip February 2012* (pp. 1-72). Cambridge, UK: University of Cambridge, Image Cat, CAR.
- Podestá, G., Letson, D., Messina, C., Royce, F., Ferreyra, R. A., Jones, J., . . . O'Brien, J. J. (2002). Use of ENSO-related climate information in agricultural decision making in Argentina: a pilot experience. *Agricultural Systems*, 74(3), 371-392. doi: [http://dx.doi.org/10.1016/S0308-521X\(02\)00046-X](http://dx.doi.org/10.1016/S0308-521X(02)00046-X)
- Preece, D. (2012a, August 3, 2012). Action demanded on coast erosion, *Hauraki Herald*.
- Preece, D. (2012b, April 13, 2012). Erosion needs quick fix, *Hauraki Herald*.
- Preston, B., Westaway, R., & Yuen, E. (2011). Climate adaptation planning in practice: an evaluation of adaptation plans from three developed nations. *Mitigation and Adaptation Strategies for Global Change*, 16(4), 407-438. doi: 10.1007/s11027-010-9270-x
- QEII National Trust. (2011). Helping landowners protect New Zealand's special open spaces. Retrieved 04.05.2013, 2013, from <http://www.openspace.org.nz/>
- Rabinow, P., & Sullivan, W. M. (Eds.). (1987). *Interpretive Social Science*. Berkeley and Los Angeles: University of California Press.
- Radio New Zealand News. (2013). IPCC report won't change Govt policy - Groser. Retrieved 01.10.2013, 2013, from <http://www.radionz.co.nz/news/political/223089/ipcc-report-won%27t-change-govt-policy-groser>
- Rahmstorf, S. (2010). A new view on sea level rise. *Nature Reports*(1004), 44-45.
- Rahmstorf, S., Cazenave, A., Church, J. A., Hansen, J., Keeling, R. F., Parker, D. E., & Somerville, R. C. J. (2007). Recent Climate Observations Compared to Projections. *Science*, 316(5825), 709-. doi: 10.1126/science.1136843
- Ramsay, D., Gibberd, B., Dahm, J., & Bell, R. G. (2012). Defining coastal hazard zones and setback lines: A guide to good practice. Hamilton, NZ: National Institute of Water and Atmospheric Research.
- Ramsden, A., & Bate, A. (2008). Using Word Clouds in Teaching and Learning: University of Bath.
- Randers, J. (2012). *2052: A Global Forecast for the Next Forty Years (A Report to the Club of Rome)*. Vermont: Chelsea Green Publishing.
- Ranford, J. (2009). 'Pakeha', its origin and meaning. Retrieved 01.06.2010, 2010, from <http://maorinews.com/writings/papers/other/pakeha.htm>
- Reilly, J., & Schimmelpfennig, D. (2000). Irreversibility, Uncertainty, and Learning: Portraits of Adaptation to Long-Term Climate Change. *Climatic Change*, 45(1), 253-278.
- Reisinger, A., Mullan, A., Manning, M., Wratt, D., & Nottage, R. (2010). Global and local climate change scenarios to support adaptation in New Zealand. *Climate change adaptation in New Zealand: Future scenarios and some sectoral perspectives*. Nottage, RAC, Wratt, DS, Bornman, JF, Jones,

- K. (eds). *New Zealand Climate Change Centre, Wellington*, 26-43.
- Renn, O. (2008). *Risk Governance: Coping with Uncertainty in a Complex World*. London: Earthscan.
- Renn, O., Klinke, A., & Van Asselt, M. (2011). Coping with Complexity, Uncertainty and Ambiguity in Risk Governance: A Synthesis. *Ambio*, 40, 231-246.
- Renowden, G. (2012). NZ Government dumps National Environmental Standard for Sea Level Rise. Retrieved 01.07.2013, 2013, from <http://hot-topic.co.nz/nz-govt-dumps-national-environmental-standard-for-sea-level-rise/>
- Rhodes, C., & Brown, A. D. (2005). Narrative, organizations and research. *International Journal of Management Reviews*, 7(3), 167-188. doi: 10.1111/j.1468-2370.2005.00112.x
- Richards, H., & Emslie, C. (2000). The "doctor" or the "girl from the university"? Considering the influence of professional roles on qualitative interviewing. *Family Practice*, 17(1), 71-75.
- Ricoeur, P. (1991a). *From Text to Action: Essays in Hermeneutics, II* (K. Blamey & J. B. Thompson, Trans. Vol. 2). Evanston, Illinois: Northwestern University Press.
- Ricoeur, P. (1991b). Narrative Identity. In D. Wood (Ed.), *On Paul Ricoeur: Narrative and Interpretation* London Routledge
- Riessman, C. K. (1993). *Narrative Analysis*. Newbury park, CA: Sage.
- Rittel, H., & Webber, M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4, 155-169.
- Resource Management Act (1991).
- Robbins, P. (2010). *Political Ecology: A Critical Introduction*. New York: Blackwell.
- Robbins, P. (2012). *Political Ecology: A Critical Introduction* (2 ed.). New York: Blackwell.
- Roberts, M. W., Norman, W., Minhinnick, N., Wihongi, D., & Kirkwood, C. (1995). Kaitiakitanga: Maori perspectives on conservation. *Pacific Conservation Biology*, 2, 7-20.
- Robson, C. (2002). *Real World Research* (2 ed.). Oxford: Basil Blackwell.
- Rockström, J., Steffen, W., Noone, K., Persson, A., Chapin, F. S., Lambin, E. F., . . . Foley, J. A. (2009). A safe operating space for humanity. *Nature*, 461(7263), 472-475.
- Roe, E. (1994). *Narrative policy analysis: theory and practice*. Durham: Duke University Press.
- Rogelj, J., McCollum, D. L., Reisinger, A., Meinshausen, M., & Riahi, K. (2013). Probabilistic cost estimates for climate change mitigation. *Nature*, 493(7430), 79-83.
- Roggema, R., & van den Dobbelsteen, A. (2012). Swarm planning for climate change: an alternative pathway for resilience. *Building Research & Information*, 40(5), 606-624. doi: 10.1080/09613218.2012.710047
- Romero-Lankao, P. (2012). Governing Carbon and Climate in the Cities: An Overview of Policy and Planning Challenges and Options. *European Planning Studies*, 20(1), 7-26. doi: 10.1080/09654313.2011.638496
- Roncoli, C., Crane, T., & Orlove, B. (2009). Fielding Climate Change in Cultural Anthropology. In S. A. Crate & M. Nutall (Eds.), *Anthropolgy Climate*

- Change From Encounters to Actions* (pp. 87-115). Walnut Creek, CA: Left Coast Press
- Roncoli, C., & Magistro, J. (2000). Global Science, Local Practice: Anthropological Dimensions of Climate Variability. *Practicing Anthropologist* 22(4), 2-5.
- Rosaldo, R. (1989). *Culture and Truth: The Remaking of Social Analysis*. Boston, MA: Beacon Press.
- Rose, N., & Miller, P. (2010). Political power beyond the State: problematics of government. *The British Journal of Sociology*, 61, 271-303. doi: 10.1111/j.1468-4446.2009.01247.x
- Rouse, H. (2010). *Coastal Adaptation to Climate Change*. National Institute of Water and Atmospheric Research (NIWA). Wellington.
- Rousseau, D., & Fried, Y. (2001). Location, location, location: contextualising organisational research. *Journal of Organizational Behaviour*, 22, 1-14.
- RTCC (Producer). (2012, 17.04.2013). Stephen Hawking: climate disaster within 1000 years. Retrieved from <http://www.rtcc.org/stephen-hawking-warns-of-climate-disaster-ahead-of-70th-birthday/>
- RTPI. (2012). Policy Statement on Initial Planning Education. London: The Royal Town Planning Institute.
- Rubin, H. (2007, September 15, 2007). Ayn Rand's Literature of Capitalism, *The New York Times*. Retrieved from http://www.nytimes.com/2007/09/15/business/15atlas.html?_r=0
- Rudiak-Gould, P. (2011). Climate change and anthropology: The importance of reception studies. *Anthropology Today*, 27(2), 9-12. doi: 10.1111/j.1467-8322.2011.00795.x
- Rudiak-Gould, P. (2012). Promiscuous corroboration and climate change translation: A case study from the Marshall Islands. *Global Environmental Change*, 22(1), 46-54. doi: <http://dx.doi.org/10.1016/j.gloenvcha.2011.09.011>
- Rust, S. (2013, March 12, 2013). Catch shares leave fishermen reeling, *The Bay Citizen*. Retrieved from <https://http://www.baycitizen.org/news/environment/system-turns-us-fishing-rights-into-commodity-sque/>
- Salick, J., & Byg, A. (2007). Indigenous peoples and climate change. *Tyndall Center for Climate Change Research, Oxford*.
- Salinger, M. J., Renwick, J. A., & Mullan, A. B. (2001). Interdecadal Pacific Oscillation and South Pacific Climate *International Journal of Climatology*, 21, 1705-1721.
- Sanchirico, J., & Newell, R. (2006). Catching Market Efficiencies Quota-Based Fisheries Management. *The RFF Reader in Environmental And Resource Policy*, 131.
- Sandvik, H. (2008). Public concern over global warming correlates negatively with national wealth. *Climatic Change*, 90(3), 333-341. doi: 10.1007/s10584-008-9429-6
- Saunders, W. S. A., & Beban, J. S. (2012). Putting R (isk) in the RMA. Lower Hutt, NZ: GNS Science.
- Saville-Troike, M. (2008). *The ethnography of communication: An introduction*. Malden, MA: Wiley-Blackwell.
- Schafer, R. (1992). *Retelling a life: Narration and dialogue in psychoanalysis*

New York: Basic Books

- Schipper, E. L. F. (2007). Climate Change Adaptation and Development: Exploring the Linkages. *Tyndall Centre Working Paper*, 107.
- Schipper, E. L. F., & Burton, I. (2009). Understanding Adaptation: Origins, Concepts, Practice and Policy. In E. L. F. Schipper & I. Burton (Eds.), *The Earthscan Reader on Adaptation to Climate Change* (pp. 1-8). London: Earthscan
- Schipper, E. L. F., & Pelling, M. (2006). Disaster risk, climate change and international development: scope for, and challenges to, integration. *Disasters*, 30(1), 19-38. doi: 10.1111/j.1467-9523.2006.00304.x
- Schlacher, T. A., Dugan, J., Schoeman, D. S., Lastra, M., Jones, A., Scapini, F., . . . Defeo, O. (2007). Sandy beaches at the brink. *Diversity and Distributions*, 13(5), 556-560. doi: 10.1111/j.1472-4642.2007.00363.x
- Schmidt-Thomé, P., & Klein, J. (2011). Applying Climate Change Adaptation in Spatial Planning Processes. In C. W. Finkl (Ed.), *Global Change and Baltic Coastal Zones* (Vol. 1, pp. 177-192): Springer Netherlands
- Schneider, P. (2010). *Current and future climate change adaptation of a vulnerable coastal community on the Coromandel Peninsula, New Zealand*. (Master of Resource and Environmental Planning), Massey University, Palmerston North, NZ.
- Scholte, B. (1969). Toward a Reflexive and Critical Anthropology. In D. Hymes (Ed.), *Reinventing Anthropology* (pp. 430-457). New York: Pantheon
- Schuerch, M., Vafeidis, A., Slawig, T., & Temmerman, S. (2013). Modeling the influence of changing storm patterns on the ability of a salt marsh to keep pace with sea level rise. *Journal of Geophysical Research: Earth Surface*, 118(1), 84-96. doi: 10.1029/2012jf002471
- Scott, W. R. (2005). Institutional Theory. In G. Ritzer (Ed.), *Social Theory* (pp. 408-414). Thousand Oaks, CA: Sage
- Scouller, A. (2011). *The Challenges of Coastal Setbacks in New Zealand*. (Master of Planning), University of Otago, Dunedin, New Zealand. Retrieved from <http://hdl.handle.net/10523/1677>
- Seavey, J. R., Gilmer, B., & McGarigal, K. M. (2011). Effect of sea-level rise on piping plover (*Charadrius melodus*) breeding habitat. *Biological Conservation*, 144(1), 393-401. doi: <http://dx.doi.org/10.1016/j.biocon.2010.09.017>
- Sherif, B. (2001). The ambiguity of boundaries in the fieldwork experience: Establishing rapport and negotiating insider/outsider status. *Qualitative Inquiry*, 7(4), 436-447.
- Shweder, R. A., & Good, B. (2005). *Clifford Geertz by His Colleagues*. London: University of Chicago Press.
- Silverstone, R. (1993). Television, ontological security and the transitional object. *Media, Culture and Society*, 15, 573-598.
- Smit, B., Burton, I., Klein, R., & Wandel, J. (2000). An Anatomy of Adaptation to Climate Change and Variability. *Climatic Change*, 45(1), 223-251.
- Smit, B., & Pilifosova, O. (2003). Adaptation to Climate Change in the Context of Sustainable Development and Equity. In J. J. McCarthy, et al (Ed.), *Climate Change 2001: Impacts, Adaptation, and Vulnerability*. Cambridge, UK: Cambridge University Press

- Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change*, 16(3), 282-292.
- Smith, G. H. (2003). *Kaupapa Maori Theory: Theorizing Indigenous Transformation of Education & Schooling*. Paper presented at the Kaupapa Maori Symposium - NZARE/AARE Joint Conference, Auckland, NZ. <http://www.aare.edu.au/03pap/pih03342.pdf>
- Smith, J., & Jenks, C. (2005). Complexity, Ecology and the Materiality of Information. *Theory, Culture & Society*, 22(5), 141-163. doi: 10.1177/0263276405057048
- Smith, J. B., Schneider, S. H., Oppenheimer, M., Yohe, G. W., Hare, W., Mastrandrea, M. D., . . . van Ypersele, J.-P. (2009). Assessing dangerous climate change through an update of the Intergovernmental Panel on Climate Change (IPCC) "reasons for concern" . *Proceedings of the National Academy of Sciences*, 106(11), 4133-4137. doi: 10.1073/pnas.0812355106
- Smith, J. B., Vogel, J. M., & Cromwell, J. E. I. (2009). An architecture for government action on adaptation to climate change. An editorial comment. *Climatic Change*, 95(1-2), 53-61. doi: 10.1007/s10584-009-9623-1
- Smith, L. T. (1999). *Decolonizing methodologies*. Dunedin: Otago Press.
- Smith, P., & Riley, A. (2009). *Cultural theory: An introduction*. Malden, MA and Oxford, UK: Wiley-Blackwell.
- Solomon, S. (2007). *Climate change 2007: contribution of working group I to the fourth assessment report of the intergovernmental panel on climate change*: Cambridge University Press.
- Somers, M. R., & Gibson, G. D. (1994). Reclaiming the epistemological "Other": narrative and the social constitution of identity In C. Calhoun (Ed.), *Social Theory and the Politics of Identity* Cambridge, MA: Blackwell
- Sperling, F., & Szekely, F. (2005). Disaster risk management in a changing climate *World Conference on Disaster Reduction*. Kobe: Vulnerability and Adaptation Resource Group (VARG).
- Springate-Baginski, O., & Blaikie, P. (2007). *Forests, people and power: The political ecology of reform in South Asia*. London, UK: Earthscan.
- Stacey, M. (1974). The myth of community studies. In C. Bell & H. Newby (Eds.), *The sociology of community* (pp. 13-26). New York, NY: Frank Cass and Company Ltd
- Stake, R. E. (1995). *The Art of Case Study Research*. Thousand Oaks, CA: Sage.
- Stake, R. E. (2005). Qualitative case studies. In N. Denzin & Y. Lincoln (Eds.), *The Sage handbook of qualitative research* (pp. 443-466). Thousand Oaks, CA: Sage
- Statistics New Zealand. (2007a). Quick Stats About Te Puru-Thornton Bay. Retrieved 26.04.2010, 2010, from <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=3533604>
- Statistics New Zealand. (2007b). QuickStats About Whitianga Retrieved 20.03.2013, 2013, from <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?tab=PopulationDwellings&id=3533000>
- Statistics New Zealand. (2008). *Housing Indicators 2008*. Wellington, NZ:

Retrieved from

http://www.stats.govt.nz/browse_for_stats/people_and_communities/housing/housing-indicators.aspx.

- Steedman, C. (1996). About ends: on the ways in which the end is different from an ending *History of the Human Sciences*, 9(4), 99-114.
- Steffen, W., Sanderson, A., Jaeger, J., Tyson, P. D., Moore III, B., Matson, P. A., . . . Wasson, R. J. (2004). *Global Change and the Earth System: A Planet under Pressure*. Heidelberg, Germany: Springer.
- Stern, N., & Treasury, C. O.-H. (2007). *The Economics of Climate Change*. New York: Cambridge University Press.
- Stevenson, M. G. (1996). Indigenous knowledge in environmental assessment. *Arctic*, 278-291.
- Stewart, C., Leonard, G., Johnston, D., & Hume, T. (2005). The 2003 National Coastal Community Survey: Results for Waikato communities. Wellington: Institute of Geological & Nuclear Sciences (GNS).
- Stocker, L., Kenchington, R., Kennedy, D., & Steven, A. (2012). Introduction to Australian coasts and human influences. In R. Kenchington, L. Stocker & D. Wood (Eds.), *Sustainable Coastal Management and Climate Adaptation: Global Lessons from Regional Approaches in Australia* (pp. 1-28). Collingwood, VIC: CSIRO Publishing
- Stockholm Resilience Centre. (2007). Resilience dictionary. Retrieved 23.12.2013, 2013, from <http://www.stockholmresilience.org/21/research/what-is-resilience/resilience-dictionary.html>
- Stone, D. (2002). *Policy Paradox: The Art of Political Decision Making, Revised Edition* (Vol. 3). New York: W. W. Norton.
- Storper, M. (2001). The poverty of radical theory today: from the false promises of Marxism to the mirage of the cultural turn. *International Journal of Urban and Regional Research*, 25, 155-179.
- Stott, P., Gillett, N. P., Hegerl, G. C., Karoly, D. J., Stone, D. A., Zhang, X., & Zwiers, F. (2010). Detection and attribution of climate change: a regional perspective. *Wiley Interdisciplinary Reviews: Climate Change*, 1(2), 192-211. doi: 10.1002/wcc.34
- Strauss, A., & Corbin, J. (1994). Grounded theory methodology. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (pp. 273-285). Thousand Oaks, CA: Sage Publications
- Stringer, L. C., Dougill, A. J., Fraser, E., Hubacek, K., Prell, C., & Reed, M. S. (2006). Unpacking "participation" in the adaptive management of social-ecological systems: a critical review. *Ecology and Society*, 11(2), 39.
- Sultana, F. (2007). Reflexivity, Positionality and Participatory Ethics: Negotiating Fieldwork Dilemmas in International Research. *ACME*, 6(3), 374-385.
- Swidler, A. (1986). Culture in Action. *American Sociological Review*, 51, 273-286.
- Taleb, N. (2012). *Antifragile: things that gain from disorder*. New York: Random House.
- Tangley, L. (1988). Preparing for Climate Change. *Bioscience*, 38(1), 14-18.
- Taylor, B., & de Loë, R. C. (2012). Conceptualizations of local knowledge in collaborative environmental governance. *Geoforum*, 43(6), 1207-1217.

doi: <http://dx.doi.org/10.1016/j.geoforum.2012.03.007>

- Taylor, J. (2011). The intimate insider: Negotiating the ethics of friendship when doing insider research. *Qualitative Research*, 11(1), 3-22.
- Taylor, S., & Wetherell, W. (1995). Doing construction work: Discourses and national identity. *Sites*(30), 69-84.
- TCDC. (2007). Coromandel Peninsula Blueprint - Framework for our Future *Housing* (Vol. 2007). Thames, NZ: Thames-Coromandel District Council, Environment Waikato, Hauraki Whaanui, & Department of Conservation.
- TCDC. (2010a). Coromandel Peninsula Blueprint - Framework for our Future (Vol. 2010). Thames, NZ: Thames-Coromandel District Council, Environment Waikato, Hauraki Whaanui, & Department of Conservation.
- TCDC. (2010b). *Thames Coromandel District Plan*. Thames, NZ: Thames Coromandel District Council Retrieved from <http://web.tcdc.govt.nz/Plan24/pages/plan/Book.aspx?hid=8960&s=climate+change>.
- TCDC. (2011). Free public seminar on changing climate. Retrieved 01.10.2013, 2013, from <http://www.tcdc.govt.nz/Your-Council/News-and-Media/News-and-Public-Notices/News-Archived-Articles/July-2011/Free-public-seminar-on-changing-climate/>
- TCDC. (2012a). Coastal Erosion Maps and Frequently Asked Questions. Retrieved 01.05.2013, 2013, from <http://www.tcdc.govt.nz/Have-Your-Say/Closed-Submissions/Coastal-Areas-and-Landscape-Maps/>
- TCDC. (2012b). Solution to coastal erosion at Cooks Beach *Latest News & Public Notices*. Thames, NZ: Thames Coromandel District Council.
- TCDC. (2013a). Coromandel Peninsula Blueprint. Retrieved 12.10.2013, 2013, from <http://www.tcdc.govt.nz/Your-Council/Documents-incl-Bylaws-Policies-and-Strategies/Coromandel-Peninsula-Blueprint/>
- TCDC. (2013b). District Plan Review Committee - Rural Environment - Rural Activities (Vol. Attachment G, pp. 4). Thames, New Zealand: Thames-Coromandel District Council.
- Te Ahukaramū, C. R. (2012). Papatūānuku – the land - Whenua – the placenta. Retrieved 10.05.2013, 2013, from <http://www.TeAra.govt.nz/en/papatuanuku-the-land/page-4>
- The Guardian. (2013). Philippines hit by 'worst typhoon on record', *The Guardian*. Retrieved from <http://www.theguardian.com/world/2013/nov/07/philippines-worst-typhoon-haiyan>
- The World Bank. (2012). World Development Indicators. Retrieved 02.02.2014, 2014, from <http://data.worldbank.org/indicator>
- Thompson, A., Robbins, P., Sohngen, B., Arvai, J., & Koontz, T. (2006). Economy, Politics and Institutions: From Adaptation to Adaptive Management in Climate Change. *Climatic Change*, 78, 1-5.
- Thomsen, D., Smith, T., Carter, R., & Mayes, G. (2009). Defining Community: Understanding the Meaning of 'the Community' in Coastal Zone Management. *Journal of Coastal Research*(Special Issue 56), 1316-1319.
- Tompkins, E. L., Adger, W. N., Boyd, E., Nicholson-Cole, S., Weatherhead, K., & Arnell, N. (2010). Observed adaptation to climate change: UK evidence of transition to a well-adapting society. *Global Environmental Change*,

- 20(4), 627-635.
- Tompkins, E. L., Boyd, E., Nicholson-Cole, S., Weatherhead, K., Arnell, N., & Adger, W. N. (2009). An Inventory of Adaptation to Climate Change in the UK: Challenges and Findings (Vol. Working Paper 135): Tyndall Centre for Climate Change Research.
- Tompkins, E. L., & Eakin, H. (2012). Managing private and public adaptation to climate change. *Global Environmental Change*, 22(1), 3-11. doi: <http://dx.doi.org/10.1016/j.gloenvcha.2011.09.010>
- Tompkins, R. (1978). Genie control of axolotl metamorphosis. *American Zoologist*, 18(2), 313-319.
- Transparency International. (2011). Global Corruption Report. In G. Sweeney, R. Dobson, K. Despota & D. Zinnbauer (Eds.). London: Transparency International: the global coalition against corruption.
- Trenberth, K. E. (2011). The climate crisis: An introductory guide to climate change. *Eos Trans. AGU*, 92(25). doi: 10.1029/2011eo250010
- Tribbia, J., & Moser, S. C. (2008). More than information: what coastal managers need to plan for climate change. *Environmental Science & Policy*, 11(4), 315-328.
- Turner, B. L. (2005). Geography's profile in public debate 'inside the Beltway' and the national academies *The Professional Geographer*, 57(3), 462-467.
- Turner, B. L., Kasperson, R. E., Matson, P. A., McCarthy, J. J., Corell, R. W., Christensen, L., . . . Schiller, A. (2003). A framework for vulnerability analysis in sustainability science. *Proceedings of the National Academy of Sciences of the United States of America*, 100(14), 8074-8079. doi: 10.1073/pnas.1231335100
- Twain, M. (2010). *Autobiography of Mark Twain: The Mark Twain papers*. In H. E. Smith (Ed.), (Vol. 1). Berkeley: University of California Press
- Ummenhofer, C. C., & England, M. H. (2007). Interannual extremes in New Zealand precipitation linked to modes of Southern Hemisphere climate variability. *Journal of Climate*, 20(21), 5418-5440.
- UN/ISDR. (2004). *Living with Risk*. Geneva: United Nations.
- UNEP. (1998). *Handbook on Methods for Climate Change Impact Assessment and Adaptation Strategies*. In J. F. Feenstra, I. Burton, J. B. Smith & R. S. J. Tol (Eds.). Amsterdam: United Nations Environment Programme & Institute for Environmental Studies, Vrije Universiteit.
- USGS. (2010). *A Sense of Place: A Place-Based Approach to Science for Land Management*. Retrieved 05.05.2010, 2010, from <http://www.fort.usgs.gov/resources/spotlight/place/>
- Vainio, A., & Paloniemi, R. (2013). Does belief matter in climate change action? *Public Understanding of Science*, 22(4), 382-395. doi: 10.1177/0963662511410268
- van Aalst, M. K. (2006). The impacts of climate change on the risk of natural disasters. *Disasters*, 30(1), 5-18. doi: 10.1111/j.1467-9523.2006.00303.x
- Van der Ploeg, J. (1993). Processes and Limitations of Dogon Agricultural Knowledge. In M. Hobart (Ed.), *An Anthropological Critique of Development: The Growth of Ignorance*. London: Routledge
- Van Manen, M. (1990). *Researching Lived Experience: Human science for an action sensitive pedagogy*. London: Althouse.

- Vogel, C., Moser, S. C., Kasperson, R. E., & Dabelko, G. D. (2007). Linking vulnerability, adaptation, and resilience science to practice: Pathways, players, and partnerships. *Global Environmental Change*, 17(3-4), 349-364.
- Vonortas, N., & Linquiti, P. (2012). The Value of Flexibility in Adapting to Climate Change: A Real Options Analysis of Investments in Coastal Defense. *Climate Change Economics*, 03(02).
- Waikato Regional Council. (2005). *Regional Coastal Plan*. Hamilton, NZ: Waikato Regional Council Retrieved from <http://www.waikatoregion.govt.nz/Council/Policy-and-plans/Rules-and-regulation/Regional-Coastal-Plan/Regional-Coastal-Plan/>.
- Waikato Regional Council. (2010). Proposed Waikato Regional Policy Statement (November 2010) *Environment Waikato Policy Series 2010/13*. Hamilton, NZ: Waikato Regional Council.
- Waikato Regional Council. (2012a). How healthy are our rivers? Retrieved 01.10.2013, 2013, from <http://www.waikatoregion.govt.nz/Environment/Natural-resources/Water/Rivers/healthyivers/>
- Waikato Regional Council. (2012b). Proposed Waikato Regional Policy Statement Decisions. Hamilton, NZ: Waikato Regional Council.
- Waikato Regional Council. (2012c). *Waikato RPS - Submission*. Hamilton, NZ: Waikato Regional Council Retrieved from [http://www.waikatoregion.govt.nz/PageFiles/21512/2 March/Mar 02 Item 7 Tuscany Properties Barry Brill Statement of Evidence.pdf](http://www.waikatoregion.govt.nz/PageFiles/21512/2%20March/Mar%2002%20Item%207%20Tuscany%20Properties%20Barry%20Brill%20Statement%20of%20Evidence.pdf).
- Waikato Times. (2011). Editorial: Name change is bad look, *Waikato Times*. Retrieved from <http://www.stuff.co.nz/waikato-times/opinion/4848972/Editorial-Name-change-is-bad-look>
- Walker, B., Holling, C. S., Carpenter, S. R., & Kinzig, A. (2004). Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society*, 9(2). doi: 5
- Walker, B. H. (2012). A commentary on "Resilience and water governance: adaptive governance in the Columbia Basin". *Ecology and Society*, 17(4), 29.
- Walker, P., & Fortmann, L. (2003). Whose landscape? A political ecology of the 'exurban' Sierra. *Cultural Geographies*, 10(4), 469-491. doi: 10.1191/1474474003eu285oa
- Walker, P. A. (2003). Reconsidering 'regional' political ecologies: toward a political ecology of the rural American West. *Progress in Human Geography*, 27(1), 7-24. doi: 10.1191/0309132503ph410oa
- Walker, P. A. (2006). Political Ecology: where is the policy? *Progress in Human Geography*, 30(3), 382-395.
- Walker, P. A., & Hurley, P. T. (2004). Collaboration Derailed: The Politics of "Community-Based" Resource Management in Nevada County. *Society & Natural Resources*, 17(8), 735-751. doi: 10.1080/08941920490480723
- Walker, R. (1990). *Ka whawhai tonu matou: Struggle without end*. Auckland: Penguin.
- Walker, S., Eketone, A., & Gibbs, A. (2006). An exploration of kaupapa Maori research, its principles, processes and applications. *International Journal*

- of *Social Research Methodology*, 9(4), 331 - 344.
- Walters, C. (1997). Challenges in adaptive management of riparian and coastal ecosystems *Conservation Ecology [online]*, 1(2), 1.
- Walters, C., Korman, J., Stevens, L. E., & Gold, B. (2000). Ecosystem modeling for evaluation of adaptive management policies in the Grand Canyon. *Conservation Ecology*, 4(2), 1.
- Walters, D. (2007). *Designing Community*: Elsevier.
- Walther, G.-R., Post, E., Convey, P., Menzel, A., Parmesan, C., Beebee, T. J. C., . . . Bairlein, F. (2002). Ecological responses to recent climate change. *Nature*, 416(6879), 389-395.
- Wang, J., Dent, K. D., & North, C. L. (2013). *Fisheye word cloud for temporal sentiment exploration*. Paper presented at the CHI '13 Extended Abstracts on Human Factors in Computing Systems, Paris, France.
- Ward, K. (2005). Geography and public policy: a recent history of 'policy relevance' *Progress in Human Geography*, 29, 310-319.
- Ward, K. (2006). Geography and public policy: towards public geographies *Progress in Human Geography*, 30, 495-503.
- Ward, K. (2007). Geography and public policy: activist, participatory, and policy geographies. *Progress in Human Geography*, 31, 1-11.
- Warren, A., Batterbury, S., & Osbahr, H. (2001). Soil erosion in the West African Sahel: a review and an application of a "local political ecology" approach in South West Niger. *Global Environmental Change*, 11, 79-95.
- Watt, M. S., Stone, J. K., Hood, I. A., & Manning, L. K. (2011). Using a climatic niche model to predict the direct and indirect impacts of climate change on the distribution of Douglas-fir in New Zealand. *Global Change Biology*, 17(12), 3608-3619. doi: 10.1111/j.1365-2486.2011.02486.x
- Weick, K. E. (1984). Theoretical Assumptions and Research Methodology Selection. In F. W. McFarlan (Ed.), *The Information Systems Research Challenge*. Boston, MA: Harvard Business School
- Western, J. (1992). *A passage to England: Barbadian Londoners speak of home*. Minneapolis: University of Minnesota Press.
- Western, J. (1996). *Outcast Cape Town*. Berkeley: University of California Press.
- Wheeler, S. M. (2010). A New Conception of Planning in the Era of Climate Change. *Berkeley Planning Journal*, 23(1).
- White, J., Drew, S., & Hay, T. (2009). Ethnography Versus Case Study. *Qualitative Research Journal*, 9(1), 18-27.
- White, N. E. (2012). *Local governments' risk-based approach to climate change adaptation: a missed opportunity for resilience in New South Wales* Paper presented at the 2012 Annual Conference, Climate Adaptation in Action: sharing knowledge to adapt, Melbourne, Vic.
- White, N. E., & Buultjens, J. (2013). Climate Change Policy Responses of Australian and New Zealand National Governments. In M. V. Reddy & K. Wilkes (Eds.), *Tourism, Climate Change and Sustainability* (pp. 117-132). Oxon, UK: Routledge
- Willis, J. W. (2007). *Foundations of qualitative research: Interpretive and critical approaches*. Thousand Oaks, CA: Sage.
- Wilson, E. (2006). Adapting to Climate Change at the Local Level: The Spatial Planning Response. *Local Environment*, 11(6), 609-625.

- Wilson, E., & Piper, J. (2010). *Spatial Planning and Climate Change*. Abingdon, OX: Routledge.
- Wilson, E. O. (2010). *Anthill: a novel*. London: W.W. Norton & Company, Inc.
- Wilson, G., & Nicolau, P. B. (2012). *T869 Climate change: from science to lived experience. Module 2: The lived experience of climate change. Textbook [online]*.
- Wilson, K. (1995). Mass media as sources of global warming knowledge. *Mass Communication Review*, 22, 75-89.
- Winslade, J., & Monk, G. (2000). *Narrative Mediation: A New Approach to Conflict Resolution*. San Francisco: Jossey-Bass.
- Winter, R. C., Sterl, A., Vries, J. W., Weber, S. L., & Ruessink, G. (2012). The effect of climate change on extreme waves in front of the Dutch coast. *Ocean Dynamics*, 62(8), 1139-1152. doi: 10.1007/s10236-012-0551-7
- WMO. (2012). Natural hazard. Retrieved 01.09.2013, 2013, from https://http://www.wmo.int/pages/themes/hazards/index_en.html
- Worm, B., Barbier, E. B., Beaumont, N., Duffy, J. E., Folke, C., Halpern, B. S., . . . Palumbi, S. R. (2006). Impacts of biodiversity loss on ocean ecosystem services. *Science*, 314(5800), 787-790.
- Wratt, D. (2009). Climate Variability and Change., 2009, from <http://www.niwa.co.nz/our-science/climate/information-and-resources/clivar>
- WRC. (2009). Coromandel Beaches - Coastal Hazards: Review of Primary Development Setback at Selected Beaches. Hamilton: Environment Waikato - Regional Council
- WRC. (2012a). Climate Change. Retrieved 25.04.2012, 2012, from <http://www.waikatoregion.govt.nz/Services/Regional-services/Regional-hazards-and-emergency-management/Weather-hazards/Climate-change/>
- WRC. (2012b). *Coastal developments at risk*. Hamilton, NZ: Waikato Regional Council Retrieved from <http://www.waikatoregion.govt.nz/Environment/Environmental-information/Environmental-indicators/Natural-hazards/Coastal-hazards/co14-techinfo/>.
- Wrong, D. (1979). *Power: Its forms, bases, and uses*. New York: Harper & Row.
- Yearley, S. (2009). Sociology and climate change after Kyoto: what roles for social science in understanding climate change? *Current Sociology*, 57(3), 389-405.
- Yin, R. K. (2009). *Case study research: design and methods* (4th ed.). Los Angeles, CA: Sage Publications.
- Yohe, G., & Tol, R. S. J. (2002). Indicators for social and economic coping capacity: moving toward a working definition of adaptive capacity *Gloabl Environmental Change*(12), 25-40.
- Young, A. (2013). High seas protest law passed *The New Zealand Herald*. Retrieved from http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10877937
- Young, O. R. (1999). *The Effectiveness of International Environmental Regimes: Causal Connections and Behavioral Mechanisms* Cambridge, MA: MIT Press.
- Zimmerer, K. S., & Bassett, T. J. (Eds.). (2003). *Political Ecology: An Integr. Appr. to Geography and Environment*. New York, NY: Guilford Press

APPENDICES

Ethics Application



Application No: _____ / _____
*This number is assigned when your application is accepted.
Quote on all documentation to participants and the Committee.*

Human Ethics Application

FOR APPROVAL OF PROPOSED RESEARCH/TEACHING/EVALUATION INVOLVING HUMAN PARTICIPANTS

(All applications are to be typed and presented using language that is free from jargon and comprehensible to lay people)

SECTION A

1 **Project Title** The human face of climate change: Adaptation in a vulnerable coastal community context
Projected start date for data collection January 2012 **Projected end date** December 2012
(In no case will approval be given if recruitment and/or data collection has already begun).

2 **Applicant Details** *(Select the appropriate box and complete details)*

ACADEMIC STAFF APPLICATION (excluding staff who are also students)

Full Name of Staff Applicant/s _____
School/Department/Institute _____
Campus (mark one only) Albany Palmerston North Wellington
Telephone _____ **Email Address** _____

STUDENT APPLICATION

Full Name of Student Applicant Paul Philipp Schneider
Employer (if applicable) _____
Telephone (07) 8684510 **Email Address** paul.p.schneider@gmail.com
Postal Address 1024 Thames Coast Rd, RD 5, Thames 3575
Full Name of Supervisor(s) Prof Bruce Glavovic & Dr Trisia Farrelly
School/Department/Institute School of People, Environment and Planning
Resource and Environmental Planning Programme &
Social Anthropology Programme
Campus (mark one only) Albany Palmerston North Wellington
Telephone (06) 356 9099 extn. 3509 **Email Address** t.farrelly@massev.ac.nz; b.glavovic@massev.ac.nz

GENERAL STAFF APPLICATION

Full Name of Applicant _____
Section _____
Campus (mark one only) Albany Palmerston North Wellington

Telephone Email Address

Full Name of Line Manager

Section

Telephone Email Address

3 Type of Project (provide detail as appropriate)

Staff Research/Evaluation:	Student Research:	If other, please specify:
Academic Staff	<input type="checkbox"/> Specify Qualification	<input type="checkbox"/> PhD
General Staff	<input type="checkbox"/> Specify Credit Value of Research	<input type="checkbox"/> 120
Evaluation	<input type="checkbox"/> (e.g. 30, 60, 90, 120, 240, 360)	

4 Summary of Project

Please outline in no more than 200 words in lay language why you have chosen this project, what you intend to do and the methods you will use.

(Note: All the information provided in the application is potentially available if a request is made under the Official Information Act. In the event that a request is made, the University, in the first instance, would endeavour to satisfy that request by providing this summary. Please ensure that the language used is comprehensible to all.)

The reason this project was chosen is to demonstrate that the societal impacts of climate change arguably represent one of, if not the, most important issues currently facing coastal communities. The research gap I have identified makes clear that our understanding about the drivers of unsustainable practices, and the opportunities for and barriers to adaptation is limited.

This research will analyse diverse local interests and needs, social-ecological systems, vulnerability, adaptive capacity, resilience and the ways communities can cope with environmental changes. The aim is to explore differential perceptions of climate change risks and impacts, comprehend options for adaptation, and work out how best to reconcile divergent local needs and interests in the context of coupled social-ecological systems.

The method proposed is case study research. The vulnerable coastal communities represent the 'case'. This approach enables the use of a wide range of research 'tools' to study the climate change phenomenon in its real world context. The main 'tools' deployed for the purpose of this research include the analysis of local climate change needs, interests and perceptions (conducted by key informant interviews and document analysis) and a review of 'grey' literature (i.e. council and professional documents/publications).

A maximum of 100 people living in the Thames Coromandel District or otherwise as associated with the Coromandel Peninsula will be interviewed.

5 List the Attachments to your Application, e.g. Completed "Screening Questionnaire to Determine the Approval Procedure" (compulsory), Information Sheet/s (indicate how many), Translated copies of Information Sheet/s, Consent Form/s (indicate of how many), Translated copies of Consent Form/s, Transcriber Confidentiality Agreement, Confidentiality Agreement (for persons other than the researcher / participants who have access to project data), Authority for Release of Tape Transcripts, Advertisement, Health Checklist, Questionnaire, Interview Schedule, Evidence of Consultation, Letter requesting access to an institution, Letter requesting approval for use of database, Other (please specify).

1. Completed Screening Questionnaire to Determine the Approval Procedure
2. Participant Consent Form (1 page)
3. Information Sheet including the topics the face-to-face interviews will address (1 page)

4. The Stakeholder Involvement Process (1 page)
 5. Overview of community and stakeholder selection according to contemporary issues (1 page)

SECTION B: PROJECT INFORMATION

General

- 6 I/We wish the protocol to be heard in a closed meeting (Part II). Yes No
(If yes, state the reason in a covering letter.)
- 7 Does this project have any links to previously submitted MUHEC or HDEC application(s)? Yes No
 If yes, list the MUHEC or HDEC application number/s (if assigned) and relationship/s.
- 8 Is approval from other Ethics Committees being sought for the project? Yes No
 If yes, list the other Ethics Committees.
- 9 For staff research, is the applicant the only researcher? Yes No
 If no, list the names and addresses of all members of the research team.

Project Details

- 10 **State concisely the aims of the project.**
 The aim of this research is to explore differential perceptions of climate change risks and impacts, comprehend options for adaptation, and to work out how best to reconcile divergent local needs and interests in the context of coupled social-ecological systems. In order to pursue this aim the following five objectives will be met: (1) Provide a critical review of the existing scholarship on political ecology, planning, and climate change, (2) outline the relevance of human-environment relationships, vulnerability, adaptive capacity and resilience for coastal communities on the Coromandel Peninsula and identify shortcomings of current adaptation work, (3) deepen understanding about the contested nature of climate change in New Zealand, (4) devise means to identify local challenges, opportunities and priorities for future action, and (5) develop a locally relevant approach that takes into account community reality and perception.
- 11 **Give a brief background to the project to place it in perspective and to allow the project's significance to be assessed. (No more than 200 words in lay language)**
 This project's background is growing national and international concern over the consequences of human-induced climate change but also the acceptance that climate change is already having and will increasingly continue to have significant consequences. The Intergovernmental Panel on Climate Change (IPCC) links climate change 'unequivocally' to human activity¹, New Zealand's Ministry for the Environment² anticipates a range of climate change associated shifts while New Zealand's National Institute of Water and Atmospheric Research³ points out that the potential impacts are likely to be substantial.
 The significance of this work lies in identifying actionable pathways, giving voice to those affected and assisting local communities in understanding the risks of anticipated climate change impacts.

¹ IPCC (2007). Fourth Assessment Report. Geneva, CH: Intergovernmental Panel on Climate Change.

² MFE (2008). Climate Change Effects and Impacts Assessment. In A.B. Mullan, D. Wratt, S. Dean, M. Hollis, S. Allan, T. Williams & G. J. Kenny (Eds.), A Guidance Manual for Local Government in New Zealand (Vol. 2, pp.xvii+149). Wellington, NZ.

³ NIWA (2008). Water and Atmosphere, 2ed., Vol. 16, Auckland, NZ.

12 Outline the research procedures to be used, including approach/procedures for collecting data. Use a flow chart if necessary.

The research procedure to gain insight into local climate change needs, interests and perceptions is through semi-structured face-to-face interviews with informants. The following six key themes will lead the interview process: (1) cognisance of the Coromandel Peninsula's coast and coastal development, (2) perception of climate change salience, (3) local and traditional environmental knowledge and social memory, (4) anticipated climate change impacts and vulnerability, (5) adaptation already underway, and (6) governance roles and responsibilities and future adaptation and development prospects. Participant observation and regular community meetings will furthermore complement the interview process.

While there are no specific questions that will be asked the interview process will be guided by the above themes. The interviews will be open ended and the participant's will be given the opportunity to guide or influence the interview process. This approach is considered highly valuable for this research as it enables the participant's to tell stories and express their perceptions and insights as opposed to following a rigid question-answer approach. For this reason this application does not contain an interview schedule as such.

13 Where will the project be conducted? Include information about the physical location/setting.

Eight communities on the Coromandel Peninsula have been selected for this project each facing their own issue with regard to anticipated climate change including coastal development, weather impacts, and aqua and agriculture. The eight communities are Pauamui, Kennedy Bay, Manaia, Tairua, Te Puru, Coromandel Town, Whitianga, and Whangamata.

14 If the study is based overseas:

- i) Specify which countries are involved;
- ii) Outline how overseas country requirements (if any) have been complied with;
- iii) Have the University's Policy & Procedures for Course Related Student Travel Overseas been met?
(Note: Overseas travel undertaken by students – refer to item 5.10 in the document "Additional Information" on the MUHEC website.)

15 Describe the experience of the researcher and/or supervisor to undertake this type of project?

Previous research on climate change vulnerability in the coastal community of Te Puru undertaken for Master's thesis in 2010.

16 Describe the process that has been used to discuss and analyse the ethical issues present in this project.

Liaison with April Bennett as cultural advisor as well as with local iwi manager David Taipari. Associate Professor Jeff Sluka's (Chair, ethics committee, ASAA/NZ) advice has been sought regarding the ethical issues present in this project. The MUHEC Ethics Code was read carefully and the MUHEC website was utilised to draft information the sheet and consent forms.

Participants

17 Describe the intended participants.

- One Interview per participant with Local and Regional Council representatives including hazard and planning managers, the present Thames Coromandel District Mayor and Civil Defence Manager;
- Four participants from NIWA and/or GNS involved in climate change studies;
- One gas supply representative;
- One electricity distribution representative;
- One water supply representative;
- Three participants from roading network providers/Transit NZ;
- One participant from a distributor of Petroleum Products ;
- 25 -20 Beachfront Property Owners;
- 15-20 TEK and social memory carriers, indigenous and non-indigenous;
- Five campground managers;
- 15-20 property owners affected by climate related hazards;
- Five participants who are coastal property developers;
- One Insurance representatives;
- 15-20 farmers and aquaculture representatives;
- 10 forestry representatives.

18 How many participants will be involved?

Max. 100

What is the reason for selecting this number?

(Where relevant, attach a copy of the Statistical Justification to the application form)

This number is based on the representation of the according sector (i.e. campgrounds, farms, forestries etc) within the issue identified. In total there are three issues (coastal development, weather impacts, aqua and agriculture) making up the scope of this project. These issues are spread across eight communities.

19 Describe how potential participants will be identified and recruited?

According to the issues identified for this research through the location of the property (beachfront property owners, campground managers etc), identification through local iwi manager (local indigenous knowledge carriers), the sector they work in and their involvement with the Coromandel Peninsula (i.e. insurance representative assigned to flood damages, road network provider assigned to SH 25 etc), and the role within council. Participants will be contacted either over the phone, through the post or personally, depending on the ease of access. Participants are identified based on their involvement with the issues making up the scope of this project, their affiliation with the communities selected or the geographical location of their property.

20 Does the project involve recruitment through advertising?

Yes No

(If yes, attach a copy of the advertisement to the application form)

21 Does the project require permission of an organisation (e.g. an educational institution, an academic unit of Massey University or a business) to access participants or information?

Yes No

If yes, list the organisation(s).

(Attach a copy of the draft request letter(s), e.g. letter to Board of Trustees, PVC, HoD/IS, CEO etc to the application form. Include this in your list of attachments (Q5). Note that some educational institutions may require the researcher to submit a Police Security Clearance.)

22 Who will make the initial approach to potential participants?

The project leader

23 Describe criteria (if used) to select participants from the pool of potential participants.
Length of time spent on the Coromandel Peninsula and familiarity with local climate, governance and politics.

24 How much time will participants have to give to the project?
Approximately one hour.

Data Collection

25 Does the project include the use of participant questionnaire/s? Yes No
(If yes, attach a copy of the Questionnaire/s to the application form and include this in your list of attachments (Q5))

If yes: i) indicate whether the participants will be anonymous (i.e. their identity unknown to the researcher). Yes No

ii) describe how the questionnaire will be distributed and collected.

(If distributing electronically through Massey IT, attach a copy of the draft request letter to the Director, Information Technology Services to the application form. Include this in your list of attachments (Q5) – refer to the policy on “Research Use of IT Infrastructure”.)

26 Does the project involve observation of participants? If yes, please describe. Yes No
Observation of the location of the property and the participants’ engagement and familiarity with their community. The research leader will also regularly attend community meetings. Furthermore, being part of the community the researcher interacts with potential participants on the daily basis thus enabling observations.

27 Does the project include the use of focus group/s? Yes No
(If yes, attach a copy of the Confidentiality Agreement for the focus group to the application form)
If yes, describe the location of the focus group and time length, including whether it will be in work time. *(If the latter, ensure the researcher asks permission for this from the employer).*

28 Does the project include the use of participant interview/s? Yes No
(If yes, attach a copy of the Interview Questions/Schedule to the application form)
The themes this research will explore include:
i. Knowledge of the Coromandel Peninsula’s coast and ongoing development;
ii. Perception of climate change salience;
iii. Local knowledge;
iv. Anticipated environmental changes;
v. Adaptation already underway;
vi. Governance roles and responsibilities and future development prospects.
These themes serve as guidelines as opposed to specific questions. The actual questions will depend on the participants and the context of the interview.
If yes, describe the location of the interview and time length, including whether it will be in work time. *(If the latter, ensure the researcher asks permission for this from the employer)*
The location of the interview will be one that is suitable and appropriate to the participants. Mostly this will be in their home (the project leader will always let his partner know where exactly he is going for the interview). Public or alternative venue will also be offered to participants in case they would prefer a different location. If the interviews are to take place in work time this will only be on request of the participant.

29 Does the project involve sound recording? Yes No

- 30 Does the project involve image recording, e.g. photo or video? Yes No
- If yes, please describe. (If agreement for recording is optional for participation, ensure there is explicit consent on the Consent Form)
- 31 If recording is used, will the record be transcribed? Yes No
- If yes, state who will do the transcribing.
(If not the researcher, a Transcriber's Confidentiality Agreement is required – attach a copy to the application form. Normally, transcripts of interviews should be provided to participants for editing, therefore an Authority For the Release of Tape Transcripts is required – attach a copy to the application form. However, if the researcher considers that the right of the participant to edit is inappropriate, a justification should be provided below.)
- The project leader will transcribe the recordings.
- 32 Does the project involve any other method of data collection not covered in Qs 25-31? Yes No
- If yes, describe the method used.
- 33 Does the project require permission to access databases? Yes No
- (If yes, attach a copy of the draft request letter/s to the application form. Include this in your list of attachments (Q5). *Note: If you wish to access the Massey University student database, written permission from Director, National Student Relations should be attached.*)
- 34 Who will carry out the data collection?
The project leader

SECTION C: BENEFITS / RISK OF HARM (Refer Code Section 3, Para 10)

- 35 What are the possible benefits (if any) of the project to individual participants, groups, communities and institutions?
This work will identify actionable pathways and assist local communities in understanding the risk of anticipated climate change impacts. The conclusions are anticipated to provide valuable insights for climate change policy and practice, and, specifically, how to build adaptive capacity given diverse and contested interests in New Zealand and beyond. It is hoped that this will provide valuable insights for the participants as well.
- 36 What discomfort (physical, psychological, social), incapacity or other risk of harm are individual participants likely to experience as a result of participation?
none
- 37 Describe the strategies you will use to deal with any of the situations identified in Q36.
n/a
- 38 What is the risk of harm (if any) of the project to the researcher?
none
- 39 Describe the strategies you will use to deal with any of the situations identified in Q38.
n/a
- 40 What discomfort (physical, psychological, social) incapacity or other risk of harm are groups/communities and institutions likely to experience as a result of this research?
None
- 41 Describe the strategies you will use to deal with any of the situations identified in Q40.
n/a

42 Is ethnicity data being collected as part of the project? Yes No

If yes, will the data be used as a basis for analysis? If so, justify this use in terms of the number of participants.

The data will be used as a basis for the analysis given the potential value of Maori environmental knowledge. Up to 20 interviews will be held with local traditional environmental knowledge carriers such as kaumatua. The insights from Maori for this research are anticipated to assist in deepening and refining understanding of the human face of climate change and how vulnerable communities, can successfully deal with projected changes. Maori environmental knowledge has the potential to establish the changes that community members see over time, how they perceive them and how these changes can be explained.

If no, justify this approach, given that in some research an analysis based on ethnicity may yield results of value to Maori and to other groups.

(Note that harm can be done through an analysis based on insufficient numbers)

43 If participants are children/students in a pre-school/school/tertiary setting, describe the arrangements you will make for children/students who are present but not taking part in the research.

(Note that no child/student should be disadvantaged through the research)

n/a

SECTION D: INFORMED & VOLUNTARY CONSENT (Refer Code Section 3, Para 11)

44 By whom and how, will information about the research be given to potential participants?

The project leader will provide information upon request. The final work and any publications emerging will be available publicly.

45 Will consent to participate be given in writing? Yes No

(Attach copies of Consent Form/s to the application form)

If no, justify the use of oral consent.

46 Will participants include persons under the age of 16? Yes No

If yes: i) indicate the age group and competency for giving consent.

ii) indicate if the researcher will be obtaining the consent of parent(s)/caregiver(s). Yes No

(Note that parental/caregiver consent for school-based research may be required by the school even when children are competent. Ensure Information Sheets and Consent Forms are in a style and language appropriate for the age group.)

47 Will participants include persons whose capacity to give informed consent may be compromised? Yes No

If yes, describe the consent process you will use.

48 Will the participants be proficient in English? Yes No

If no, all documentation for participants (Information Sheets/Consent Forms/Questionnaire etc) must be translated into the participants' first-language.

(Attach copies of the translated Information Sheet/Consent Form etc to the application form)

SECTION E: PRIVACY/CONFIDENTIALITY ISSUES (Refer Code Section 3, Para 12)

49 Will any information be obtained from any source other than the participant? Yes No

If yes, describe how and from whom.

Council and professional documents/publications will be obtained online from the local and regional councils.

50 Will any information that identifies participants be given to any person outside the research team? Yes No

If yes, indicate why and how.

51 Will the participants be anonymous (i.e. their identity unknown to the researcher?) Yes No

If no, explain how confidentiality of the participants' identities will be maintained in the treatment and use of the data.

Participants' identities will only be known to the project leader and interview recordings and consent forms will be stored separately in a safe environment accessible only to the project leader. Codes will be used for participants and names will not be written on the sound storage medium.

52 Will an institution (e.g. school) to which participants belong be named or be able to be identified? Yes No

If yes, explain how you have made the institution aware of this?

A letter outlining the study will be sent to the respective institutions requesting permission for identification as part of research findings (i.e. civil defence, road network provider, gas supply representative etc).

53 Outline how and where:

i) the data will be stored, and

(Pay particular attention to identifiable data, e.g. tapes, videos and images)

The data will be stored on a password protected computer hard drive. The sound recordings will be stored in the project leader's gun cabinet (including the recording devices). Additionally the names of the participants will be encoded.

ii) Consent Forms will be stored.

(Note that Consent Forms should be stored separately from data)

Consent forms, transcripts or notes will be kept separate in locked desk drawers in the project leader's office.

54 i) Who will have access to the data/Consent Forms?

The project leader only.

ii) How will the data/Consent Forms be protected from unauthorised access?

The data will be stored on a password protected computer hard drive. The sound recordings will be stored in the project leader's gun cabinet (including the recording devices). Additionally the names of the participants will be encoded. Consent forms, transcripts or notes will be kept separate in locked desk drawers in the project leader's office.

- 55 How long will the data from the study be kept, who will be responsible for its safe keeping and eventual disposal? (Note that health information relating to an identifiable individual must be retained for at least 10 years, or in the case of a child, 10 years from the age of 16).

(For student research the Massey University HOD/Institute/School/Section/Supervisor/or nominee should be responsible for the eventual disposal of data. Note that although destruction is the most common form of disposal, at times, transfer of data to an official archive may be appropriate. Refer to the Code, Section 4, Para 24.)

The data will be destroyed immediately on completion of study at end of 2013. The project leader will be responsible for its safekeeping and eventual disposal. This will be confirmed by the project supervisor(s).

SECTION F: DECEPTION (Refer Code Section 3, Para 13)

- 56 Is deception involved at any stage of the project? Yes No

If yes, justify its use and describe the debriefing procedures.

SECTION G: CONFLICT OF ROLE/INTEREST (Refer Code Section 3, Para 14)

- 57 Is the project to be funded in any way from sources external to Massey University? Yes No

If yes: i) state the source.

ii) does the source of the funding present any conflict of interest with regard to the research topic?

- 58 Does the researcher/s have a financial interest in the outcome of the project? Yes No

If yes, explain how the conflict of interest situation will be dealt with.

- 59 Describe any professional or other relationship between the researcher and the participants? (e.g. employer/employee, lecturer/student, practitioner/patient, researcher/family member). Indicate how any resulting conflict of role will be dealt with.

The project leader is part of the local community (place based researcher). No resulting conflict is expected. The project leader already has experience from interviewing local community members for his Master's research. Conflicts will be avoided however possible.

SECTION H: COMPENSATION TO PARTICIPANTS (Refer Code Section 4, Para 23)

- 60 Will any payments or other compensation be given to participants? Yes No

If yes, describe what, how and why.

(Note that compensation (if provided) should be given to all participants and not constitute an inducement. Details of any compensation provided must be included in the Information Sheet.)

SECTION I: TREATY OF WAITANGI (Refer Code Section 2)

61 Are Maori the primary focus of the project? Yes No

If yes: Answer Q62 – 65

If no, outline: i) what Maori involvement there may be, and

ii) how this will be managed.

Interviews will be held with local traditional environmental knowledge carriers such as kaumatua. The insights from Maori for this research are anticipated to assist in deepening and refining understanding of the human face of climate change and how vulnerable communities can successfully deal with projected changes.

The involvement will be discussed with the local iwi manager and with the cultural advisor for this study.

The researcher has been and will continue to be in contact with the local iwi manager and the cultural advisor of this research.

62 Is the researcher competent in te reo Maori and tikanga Maori? Yes No

If no, outline the processes in place for the provision of cultural advice.

The involvement will be discussed with the local iwi manager David Taipari and with the cultural advisor April Bennett for this study.

The researcher has been and will continue to be in contact with the local iwi manager and the cultural advisor of this research.

63 Identify the group/s with whom consultation has taken place or is planned and describe the consultation process.

(Where consultation has already taken place, attach a copy of the supporting documentation to the application form, e.g. a letter from an iwi authority)

Apart from initial meetings with the cultural advisor and the local iwi manager no consultation has taken place to date. A support letter from the local iwi manager is forthcoming. Organisations interviewees work for – (forestry, gas, water companies etc.) will be contacted outlining the research and requesting permission.

64 Describe any ongoing involvement of the group/s consulted in the project.

n/a

65 Describe how information resulting from the project will be shared with the group/s consulted?

A summary of the research findings will be sent to participants on request. The findings may also be published in academic literature.

SECTION J: CULTURAL ISSUES (Refer Code Section 3, Para 15)

66 Other than those issues covered in Section I, are there any aspects of the project that might raise specific cultural issues? Yes No

If yes, explain. Otherwise, proceed to Section K.

67 What ethnic or social group/s (other than Maori) does the project involve?

n/a

68 Does the researcher speak the language of the target population? Yes No

If no, specify how communication with participants will be managed.

- 69 Describe the cultural competence of the researcher for carrying out the project.
(Note that where the researcher is not a member of the cultural group being researched, a cultural advisor may be necessary)
 The project leader is a member of the community selected and a cultural advisor has been appointed.
- 70 Identify the group/s with whom consultation has taken place or is planned.
(Where consultation has already taken place, attach a copy of the supporting documentation to the application form)
 Please refer to answer to Question 63
- 71 Describe any ongoing involvement of the group/s consulted in the project.
 n/a
- 72 Describe how information resulting from the project will be shared with the group/s consulted.
 Please refer to answer to Question 65.
- 73 If the research is to be conducted overseas, describe the arrangements you will make for local participants to express concerns regarding the research.
 n/a

SECTION K: SHARING RESEARCH FINDINGS (Refer Code Section 4, Para 26)

- 74 Describe how information resulting from the project will be shared with participants and disseminated in other forums, e.g. peer review, publications, conferences.
(Note that receipt of a summary is one of the participant rights)
 Please refer to answer to Question 65

SECTION L: INVASIVE PROCEDURES/PHYSIOLOGICAL TESTS (Refer Code Section 4, Para 21)

- 75 Does the project involve the collection of tissues, blood, other body fluids or physiological tests? *(If yes, complete Section L, otherwise proceed to Section M)* Yes No
- If yes, are the procedures to be used governed by Standard Operating Procedure(s)? If so, please name the SOP(s). If not, identify the procedure(s) and describe how you will minimise the risks associated with the procedure(s)?
- 76 Describe the material to be taken and the method used to obtain it. Include information about the training of those taking the samples and the safety of all persons involved. If blood is taken, specify the volume and number of collections.
- 77 Will the material be stored? Yes No
 If yes, describe how, where and for how long.
- 78 Describe how the material will be disposed of (either after the research is completed or at the end of the storage period).

(Note that the wishes of relevant cultural groups must be taken into account)

- 79 Will material collected for another purpose (e.g. diagnostic use) be used? Yes No
If yes, did the donors give permission for use of their samples in this project? Yes No
(Attach evidence of this to the application form).

If no, describe how consent will be obtained. Where the samples have been anonymised and consent cannot be obtained, provide justification for the use of these samples.

- 80 Will any samples be imported into New Zealand? Yes No
If yes, provide evidence of permission of the donors for their material to be used in this research.

- 81 Will any samples go out of New Zealand? Yes No
If yes, state where.
(Note this information must be included in the Information Sheet)

82 Describe any physiological tests/procedures that will be used.

- 83 Will participants be given a health-screening test prior to participation? (If yes, Yes No
attach a copy of the health checklist)

Reminder: Attach the completed Screening Questionnaire and other attachments listed in Q5

SECTION M: DECLARATION (Complete appropriate box)

ACADEMIC STAFF RESEARCH

Declaration for Academic Staff Applicant

I have read the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants. I understand my obligations and the rights of the participants. I agree to undertake the research as set out in the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants. My Head of Department/School/Institute knows that I am undertaking this research. The information contained in this application is to the very best of my knowledge accurate and not misleading.

Staff Applicant's Signature Date:

STUDENT RESEARCH

Declaration for Student Applicant

I have read the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants and discussed the ethical analysis with my Supervisor. I understand my obligations and the rights of the participants. I agree to undertake the research as set out in the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants.

The information contained in this application is to the very best of my knowledge accurate and not misleading.

Student Applicant's Signature Date: 22/06/2011



Declaration for Supervisor

I have assisted the student in the ethical analysis of this project. As supervisor of this research I will ensure that the research is carried out according to the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants.

Supervisor's Signature

Date: 24 June 2011



Print Name

Dr Trisia Farrelly

GENERAL STAFF RESEARCH/EVALUATIONS

Declaration for General Staff Applicant

I have read the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants and discussed the ethical analysis with my Line Manager. I understand my obligations and the rights of the participants. I agree to undertake the research as set out in the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants. The information contained in this application is to the very best of my knowledge accurate and not misleading.

General Staff Applicant's Signature

Date:

Declaration for Line Manager

I declare that to the best of my knowledge, this application complies with the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants and that I have approved its content and agreed that it can be submitted.

Line Manager's Signature

Date:

Print Name

TEACHING PROGRAMME

Declaration for Paper Controller

I have read the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants. I understand my obligations and the rights of the participants. I agree to undertake the teaching programme as set out in the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants. My Head of Department/School/Institute knows that I am undertaking this teaching programme. The information contained in this application is to the very best of my knowledge accurate and not misleading.

Paper Controller's Signature

Date:

Declaration for Head of Department/School/Institute

I declare that to the best of my knowledge, this application complies with the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants and that I have approved its content and agreed that it can be submitted.

Head of Dept/School/Inst Signature

Date:

Print Name

Ethics Amendments

11/48 The human face of climate change: Adaptation in a vulnerable coastal community context

Paul Schneider (HEC: Southern B Application 11/48)

Department: School of People, Environment & Planning

Supervisor: Prof Bruce Glavovic & Dr Trisia Farrelly

The Massey University Human Ethics Committee: Southern B considered the above application at their meeting held on Thursday 14 July 2011.

The application was provisionally approved, subject to the fulfilment of the conditions below to the satisfaction of Dr Nathan Matthews (Acting Chair).

Please note that the Committee is always willing to enter into dialogue with applicants over the points made. There may be information that has not been made available to the Committee, or aspects of the research may not have been fully understood.

SECTION B

Q12

- Please clarify what is to be observed in the community meetings, how observations are to be recorded and how the researcher intends to make meeting attendees aware that he is conducting the observations?

Public Community meetings are anticipated to provide additional insight into the contested nature of climate change and its effects on coastal communities. My experience has shown that it is at community meetings after substantial weather events resulted in damage of some sort that community members are disgruntled and call for changes to be made. The ever-increasing vulnerability curve makes clear that community members most strongly realise what needs to be done after impacts. This is also when community meetings are attended in comparatively high numbers and provide an ideal platform for the identification of further

potential participants. Community meetings reflect the substance and the dynamics strongly relevant to my research.

The observations anticipated to be made include the type and form of environmental changes community members other than those interviewed are experiencing and what solutions are proposed or even demanded from council. The observations will also assist in highlighting what will have to be done to reconcile contesting interests and promote knowledge and understanding, and, ultimately, what needs to be done to create a more sustainable future.

Observations will be recorded by making notes.

My research will be discussed with the organiser prior to the meeting. A separate information sheet will inform organisers and attendees of my research.

Q23

- Please clarify how these criteria are known prior to selection?

The criteria I will be using to select participants are essentially based on the “snowball sampling” principle which, as in the case of this study and given the fact that I am a community local community member myself, is anticipated to represent a diversity of insights. In essence this means that an informant selected for geographical reasons (i.e. exposed beachfront property) is likely to point out further informants. This is anticipated to be the case for all sectors relevant for this research

Q26

- Please provide clarification of who is to be observed and on what basis? Please note that if this group is not being interviewed, a separate information sheet would be required for this phase.
- The committees understanding from Qs 12 was that observation would be undertaken at community meetings; however, if this is not the only form of observation please provide clarification of the nature of other observations and how consent will be gained to conduct these?

In essence three types of observations will be made: 1) at public meetings, 2) in the context of individual interview situations, and 3) as part of day to day observations within the community.

When interviews are conducted at private homes and the location of the property or dwelling is of such nature that it is potentially at risk from natural hazards known to be intensified by climate change (i.e. coastal erosion, flooding) then this will be noted. My experience is that property owners will point out parts of their property already affected by natural hazards. These observations will contribute to describing how communities are and will be affected by anticipated climate change.

Observations will always be encoded so they do not reveal information potentially harmful to individuals.

Q31/FLOW CHART

- Does the researcher intend to provide participants with the opportunity of checking the transcript from their interview? This appears to be the case in the flow chart provided. If so, an “Authority for the release of tape transcripts” should be provided and this would need to be included in the information sheet to participants. If not, please provide justification (please refer to the italicised wording in parentheses in Q31).

The intention is not to return all transcripts to those interviewed. However, it has now been made clear on the information sheet that the participant has the right to request a transcript of any recordings made.

SECTION C

Q36/37

- Might there be potential sources for conflict amongst the group, e.g. opposing interests and opinions within the community? Please provide further consideration of how any subsequent conflict might be mitigated.

At public community meetings any form of conflict will be resolved by the organiser.

Other forms of conflict will be avoided as best possible. I will not be expressing or discussing my personal viewpoints or any other matter on current affairs with informants at any stage.

Q38

- If interviews are to be held in a private setting the researcher should take safety precautions, e.g. carry a mobile phone in case of emergency.

A functioning mobile phone will be carried at all times.

Q42

- The committee seeks assurance that the cultural advisor is to be consulted in the analysis of the data?

Ethnicity data collected will be discussed with my cultural advisor to ensure appropriateness. My cultural advisor has furthermore offered to provide advice not only in the analysis stage of my research but at any point in time during my Ph.D.

SECTION D

Q44

- The committee notes that an information sheet must be provided to all potential participants.

All potential participants will receive an information sheet. A summary of research findings will be made available to all participants after completion upon request.

SECTION E

Q52

- The committee notes that if participants are to be selected according to their employment and are commenting on policies of the institution for which they work, agreement from the institution is required in advance and the committee should be provided with a draft letter to institutions (and copies of the permission from institutions, when received). Also refer Qs 17 and 21.

Please find draft letters to the Regional Council, the Local Council, the Department of Conservation, Genesis Energy, the local newspaper as well as to the NZ Transport Agency and NIWA attached. Copies of the permissions will be forwarded as soon as possible.

Q55

- The committee would recommend the researcher reconsiders the length of time that data is to be stored. Please refer to part 2, section 2 of the *Massey University Code of Responsible Research Conduct and Procedures for dealing with Misconduct in Research* from the Massey University Policy Guide website: <http://policyguide.massey.ac.nz/>.
- Please note that in the case of student research, responsibility for the eventual disposal of data usually rests with the supervisor.

The researcher will, as specified in part 2 section 2 of the *Massey University Code of Responsible Research Conduct and Procedures for dealing with Misconduct in Research*, hold copies of the data until their eventual disposal by the supervisor

SECTION I

Q61/62/63

- Please provide evidence that consultation has been undertaken with both named advisors and that they are happy to continue to act in this capacity for the duration of the study.

I am currently awaiting written confirmation from both cultural advisors which will be forwarded as soon as possible.

Q65/74/INFORMATION SHEET

- Participants have the right to receive a summary of the findings; therefore please clarify how this will be undertaken and include the detail in the information sheet.

The information sheet states that participants have the right to request a summary of the research findings upon completion. This means that participants will be able to contact the researcher after completion of this study and request a summary of research findings.

INFORMATION SHEET

- The committee would usually not recommend the inclusion of home address details in the information sheet as this may breach the privacy of the researcher; however the decision rests with the researcher.
- The committee would suggest some rephrasing in order for the information sheet to be readily understood, e.g. “climate change salience”.
- The committee suggests placing participant’s rights after the paragraph on “participant identification and recruitment”; however, this decision rests with the researcher.
- The committee noted that there is an inconsistency between the application form (Qs 12 and 52 for example) and the information sheet (refer page 2, paragraph 1) in terms of seeking official organisational viewpoints. Please provide clarification and ensure that documentation is consistent.
- The committee would like clarification of bullet 5 of the participant’s rights, i.e. “renegotiate this agreement at any time during the research”?
- Ensure the inclusion of the correct committee approval statement on the information sheet as follows: *“This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 11/48. If you have any concerns about the conduct of this research, please contact Dr Nathan Matthews, Acting Chair, Massey University Human Ethics Committee: Southern B, telephone 06 350 5799 x 8729, email humanethicsouthb@massey.ac.nz.”*
- Provide a copy of the revised information sheet.

Please supply to the Secretary, one (1) copy of this email with the reply inserted under each point, plus any amended documents which should clearly identify changes made, e.g. using track changes, italics or bold font. Please ensure that your Supervisor has checked your response before you submit your reply. Do not begin your research until you receive your final letter of approval.

Ethics Approval



MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA

31 August 2011

Mr Paul Schneider
1024 Thames Coast Road
RD5
THAMES 3575

Dear Paul

Re: HEC: Southern B Application – 11/48
The human face of climate change: Adaptation in a vulnerable coastal community context

Thank you for your letter dated 29 August 2011.

On behalf of the Massey University Human Ethics Committee: Southern B I am pleased to advise you that the ethics of your application are now approved. Approval is for three years. If this project has not been completed within three years from the date of this letter, reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely

A handwritten signature in black ink, appearing to read 'N. Matthews'.

Dr Nathan Matthews, Acting Chair
Massey University Human Ethics Committee: Southern B

cc Prof Bruce Glavovic Dr Trisia Farrelly
School of People, Environment & Planning School of People, Environment & Planning
PN331 PN331

Mrs Mary Roberts, Secretary to HoS
School of People, Environment & Planning
PN331

Massey University Human Ethics Committee
Accredited by the Health Research Council

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Information Sheet



MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGĀ TANGATA

The human face of climate change: Adaptation in a vulnerable coastal community context

INFORMATION SHEET

Lead researcher: Paul Schneider, Ph.D. candidate in Resource and Environmental Planning

This is an invitation to participate in research examining ways communities are coping with environmental changes. This information sheet gives a brief explanation of what is involved in participating in this project.

Who is the project leader and what is this project about?

Project leader:

Paul Schneider is the Project Leader. I live half way between Thames and Coromandel Town and I am writing my doctoral thesis at the College of Humanities and Social Sciences at Massey University, Manawatu.

Research aim:

The aim of this research is to explore differential perceptions of climate change risks and impacts, comprehend options for adaptation, and to work out how to best reconcile divergent local needs and interests.

Benefits of this research:

This research will contribute to knowledge by addressing the current gap in comprehending climate change impacts on human-environment relationships. A crucial part of this research is to define and understand why and how climate change adds to the challenges of the future. This work will identify actionable pathways and assist local communities in understanding the risks of anticipated climate impacts.

The conclusions from this research are anticipated to provide valuable insights for climate change policy and practice, and, specifically, how to build adaptive capacity given diverse and contested interests in New Zealand and beyond.

Research approach:

Face to face interviews with a range of people associated with the Coromandel Peninsula will be conducted. These include community members potentially facing climate change issues, professionals from the public and private sector as well as people with an in-depth local knowledge. I am particularly interested in the 'real-world' context of a changing environment. This is reflected in stories, gut feelings, perceptions as well as views about climate change and development, how these influence our communities and how actionable pathways can be identified. I will not be seeking official organisational viewpoints.

Themes I would like to explore include:

- i. Knowledge of the Coromandel Peninsula's coast and ongoing development;
- ii. Perception of climate change salience;
- iii. Local knowledge;
- iv. Anticipated environmental changes;
- v. Adaptation already underway;
- vi. Governance roles and responsibilities and future development prospects.

Participant Identification and Recruitment:

A maximum of 80 people living in the Thames Coromandel District or otherwise associated with the Coromandel Peninsula will be interviewed. The two main issues identified for this research include coastal development and weather impacts. Participants are identified based on their involvement with these issues, their affiliation with the communities selected or the geographical location of their property. This research is based on informal interviews and observations of geographical settings and developments taking place. Participation is completely voluntary, individual identities will be kept strictly confidential, and, unfortunately, I can provide no compensation for your participation.

Project Procedures:

Interviews will take about one hour. The times and locations will be at your convenience.

Data Management:

With your permission, interviews will be sound-recorded. Information obtained from the interviews will be held by the researcher until their eventual disposal by the supervisors. A summary of the research findings will be available on request. The findings may also be published in academic literature.

Participant's Rights:

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 at any time during the research;
- 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;
- request a transcript of any recordings made;
- request a summary of the project findings when it is concluded;
- ask for the recorder to be turned off at any time during the interview.

Project Contacts:

Please let me know by telephone or e-mail if you are able to participate in this project; including your preferred meeting date, time, and venue.

Should you have further queries and/or any concerns please do not hesitate to contact the researcher Paul Schneider:

1024 Thames Coast Rd • RD 5 • Thames • 07 868 4510 • 021 0299 0399 •
paul.p.schneider@gmail.com

The supervisors of this research are:

Prof Bruce Glavovic • Resource and Environmental Planning Programme • Massey University • Private Bag 11 222 • Palmerston North 4442 • 06 356 9099 extn 2036 •
b.glavovic@massey.ac.nz

Dr Trisia Farrelly • Social Anthropology Programme • Massey University • Private Bag 11 222 • Palmerston North 4442 • 06 356 9099 extn 3509 • t.farrelly@massey.ac.nz

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 11/48. If you have any concerns about the conduct of this research, please contact Dr Nathan Matthews, Acting Chair, Massey University Human Ethics Committee: Southern B, telephone 06 350 5573, email humanethics@massey.ac.nz.

Consent Form



The human face of climate change: Adaptation in a vulnerable coastal community context

Lead researcher: Paul Schneider, Ph.D. candidate in Resource and Environmental Planning

PARTICIPANT CONSENT FORM

I understand the aims of this study and have had the details 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 to participate in this study under the conditions set out in the Information Sheet.

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

Signature

Date

.....

Full Name - printed

.....

Location of Interview

.....

Should you have further queries and/or any concerns please do not hesitate to contact the researcher Paul Schneider: 1024 Thames Coast Rd • RD 5 • Thames • 07 868 4510 • 021 0299 0399 • paul.p.schneider@gmail.com

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