Navigating Perceptions of Risk and Value: A Case Study on Coastal Adaptation Planning in Aotearoa, New Zealand

A thesis presented in partial fulfilment of the requirements for the degree of

Master of Resource and Environmental Planning

at Massey University, Manawatū,
New Zealand.

Christine Jo-anne Niblock

2025

Abstract

Climate change is a wicked problem of global proportions and with broad consequences. It is exacerbating coastal hazards, such as erosion and inundation and impacting coastal communities in variable and interconnected ways. Coastal adaptation planning seeks to proactively manage these risks. Actions towards coastal adaptation reflect a multitude of value positions and ways of knowing, and these are intrinsically linked to how receptive communities are to proposed adaptation strategies. The complexities of coastal adaptation planning are highlighted, before exploring the principal components of risk-based and value-based assessment in coastal adaptation planning.

The interpretation and evaluation of coastal hazard risks is particularly challenging when risk is examined in the context of the subjectivities of landscape value. Vulnerability and uncertainty add further complexities. Attributes of value can be used in risk assessment to inform coastal adaptation planning and foster local community action. For example, tolerances of risk and conceptions of what is valued and to be protected can differ greatly and be divisive across individuals, groups, and sectors.

In this research, document analysis was used to explore how risk and landscape values are evaluated and how value-based risk assessment can inform coastal adaptation planning. Drawn from the literature, a Concentric Framework for Coastal Adaptation Planning was developed and applied to the Kāpiti Coast District Council's Takutai Kāpiti Coastal Adaptation Project. As a completed coastal adaptation planning project, it presented a useful case study from which to draw insights about how planners and policymakers identified risk alongside landscape values in coastal adaptation planning. Four inter-related themes, identified from relevant literature - governance and power, risk assessment, values-based assessment and community empowerment, alongside considerations of global and local action were explored in the case study using the Concentric Framework for Coastal Adaptation Planning.

This study presents a basis for exploring coastal adaptation planning in the context of local government and presents an opportunity for further research. It found that there were differences in approaches to landscape and risk assessment, from highly technical assessments of natural character, towards more nuanced assessments of social and cultural values. The complexities of planning within an evolving political landscape were also revealed in the examination of the

proposed plan change, which lead to Takutai Kāpiti. It also found that, by addressing factors of vulnerability and matters of uncertainty in decision-making frameworks, planners can enhance a community's capability to withstand, recover and adapt to coastal hazard risks. Furthermore, when values are acknowledged through meaningful participation and inclusive engagement processes, coastal adaptation outcomes are more likely to be accepted by communities. The research provides insights into the realities of coastal adaptation planning in NZ and confirms that coastal adaptation planning is a 'wicked problem' that can never be solved, only re-solved over and over.

Acknowledgements

I would like to extend my gratitude to my lecturers for their expertise and guidance throughout the duration of my academic program, with Massey University. Their encouragement and support have been instrumental in the completion of this thesis.

Additionally, I am grateful to my family and workplace for their understanding and support. They have been a constant source of motivation and allowed me the flexibility to balance professional and academic pursuits.

Table of Contents

List of Figures

List of Tables

Chapter 1
Contextualising Challenges in Coastal Adaptation Planning

1.1 Introduction

Globally there are increasing concerns for the environmental threats posed by climate change. There is more urgency in the need to respond to the undesired effects of climate change impacting our coastal environments (IPCC, 2023). Increasing global temperatures and reducing ice volumes are contributing to rising mean sea level, while significant changes in precipitation and wind patterns are leading to intensified extreme weather events. Climate change is exacerbating coastal hazards, such as erosion and inundation. Proactive management of these risks is the objective of coastal adaptation planning (Abeysinghe, et al., 2014). This research explores two key tools of coastal adaptation planning: landscape evaluation and risk assessment.

Effects of climate change vary from locale to locale. Each country has its own geographical complexities and uniqueness (Begum, et al., 2022). This research uses document analysis to explore some of the contemporary approaches to risk assessment and landscape evaluation in coastal adaptation planning. It draws on international scholarly literature, and the policy-making experience of a small NZ coastal town, specifically the Takutai Kāpiti Coastal Adaptation Project in Kāpiti Coast. Partly chosen for practical reasons (a full suite of relevant documents were publicly available on the Council's website) the Kāpiti Coast District Council's Takutai Kāpiti Coastal Adaptation Project was also selected because the Council has acknowledged that the area is "facing significant environmental challenges from our changing climate and associated rising sea levels" (Kāpiti Coast District Council, 2024). This was evidenced when the Proposed District Plan (PDP) provisions relating to coastal hazards, which were publicly notified in 2012, were withdrawn in 2014 and 2017 because of the level of community opposition and legal challenges (Kāpiti Coast District Council, 2022).

NZ is a coastal nation situated in the southwestern Pacific Ocean. It has two narrow, linear islands; 450km wide, east-west and 1,600km long, north-south (NIWA, 2021). NZ's geographical location means the country is subjected to prevailing westerly winds and the climatic effects of multiple ocean current systems (NIWA, 2021). NZ has an estimated 15,000 kilometers of coastline, of which the coastal environment is a significant feature of

environmental, cultural and economic importance that requires sustainable management. These coastal environments vary, with moderately exposed areas to the north and east, and more highly exposed and wave-dominated areas on the west and southern coasts. The coast is interlocked with a series of sheltered harbors, estuaries and more than 420,000 kilometers of inland freshwater rivers and streams that dissect mountainous topography (NIWA, 2021).

Climatic variabilities mean NZ's coastline is vulnerable to environmental change. Specifically, changes impacting NZ's coastline include natural hazards from extreme weather events and the progressive erosion of our coastline (Hennessy, et al., 2007). Given that more than 65% of the population are located within low-lying floodplains alongside major river systems, or within 5km of an estimated 15,000 kilometers of coastline (Ministry for the Environment and Stats NZ, 2019), the social impact of climate change on NZ coastal communities will be significant (Parliamentary Commissioner for the Environment, 2015).

The Takutai Kāpiti Coastal Adaptation Project (Takutai Kāpiti) project was initiated by Kāpiti Coast District Council, in response to the need for a comprehensive plan change to address these gaps. Takutai Kāpiti was set up to provide a framework for developing pathways towards adaptation, to proactively address the risks posed on coastal communities from climate change. Coastal adaptation planning practices, as recorded in the case study documents, were compared with conceptual frameworks on risk and value-based assessments; in particular, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) framework on typologies of value.

The research, which focuses on the assessment of risk alongside landscape value, including natural values, indigenous cultural values and social or experiential values, explores the documentation of the Takutai Kāpiti Coastal Adaptation Project. It identifies learnings for planners, of the complexities and challenges that can arise when planning for the adaptation of coastal communities in NZ. The research exposes relationships between knowledges, perceptions of risk, value-based assessment and decision making for coastal adaptation in contemporary planning practice. Considering the increasingly likely severe impacts of climate change, this study concludes with insights into planning for coastal hazard risks, whilst also addressing the accommodation and preservation of landscape values through coastal adaptation planning.

1.2 Research Aim, Question, and Objectives

This research aims to understand how planners and policymakers interpret risk alongside landscape values in coastal adaptation planning, focusing on natural values, indigenous cultural values and social, experiential values. It offers insights into the complexities of assessing and interpreting risk and landscape value in coastal adaptation planning. The research relies on a singular case study: Takutai Kāpiti Coastal Adaptation Project, to extract qualitative data for analysis to answer the following question:

- What insights can be drawn from the Kāpiti Coast District Council's Takutai Kāpiti Coastal Adaptation Project about addressing landscape evaluation and risk assessment in climate adaptation planning?

The research has three objectives:

Objective 1: To explore how risk and landscape values are evaluated and gain insights from the literature on how risk and landscape assessments are to inform coastal adaptation planning. This objective provides the means for experiences to be drawn from the case study: Takutai Kāpiti Coastal Adaptation Project, that will identify insights into the assessment of landscape values, alongside considerations of risk, in coastal adaptation planning. It is important to consider the interplay of risk and value, and how perceptions and subjectivities of risk and value are managed in coastal adaptation practices.

Objective 2: To develop a framework that synthesizes the literature graphically, in order to undertake a thematic analysis of the case study documents. The purpose of this framework is to visually represent key themes and relationships of coastal adaptation planning, drawn from the literature and provide a structured lens through which to interpret the case study.

Objective 3: To apply the developed framework to the selected case study: Takutai Kāpiti Coastal Adaptation Project, to identify insights to inform coastal adaptation planning. This involves exploration of risk assessment and landscape evaluation, as expressed through the case study documents. Particular attention is given to the interplay of risk and value, and how this is managed in coastal adaptation planning.

1.3 Scope of Research

This research topic is large and complex. As a means of managing this within the constraints of a 120-credit thesis, combined with personal circumstances, this research has purposively

been delimited to explore risk and values in the context of a contained suite of documents from a case study (territorial authority) area. It presents a basis for exploring this topic in the context of local government and presents an opportunity for further research on coastal adaptation planning, specifically plan effectiveness evaluation research.

The remainder of this chapter introduces and defines key concepts, including climate change and coastal hazard risks. It situates the relevance of this topic within the context of coastal adaptation planning in NZ.

1.4 Coastal Adaptation Planning: a "Wicked Problem"

Climate-change is often referred to throughout political and planning discourse as a "wicked problem". Wicked problems are complex and contentious social and physical issues that are not easily understood, nor able to be "solved", but rather "at best they are only re-solved over and over" (Rittel & Webber, 1973, p. 160). In part, this complexity is due to climatic trends and patterns which occur very slowly and progressively. The earth's climate is generally distinguished by long term (50-year) trends and patterns of the "atmosphere, land, oceans, snow, ice and living things that serve as global background conditions and determine weather patterns" (Le Treut, et al., 2007, p. 105). These significant changes affect the earths system and are generally indiscernible to the layperson. In relation to climate change, the effects on our landscape can be difficult to comprehend.

Climate change is a problem of broad consequences and global proportions that is not easily solved. It is full of unknowns that require us to bridge perspectives of risk and value, and differences in knowledgebases and understanding (Scheller, 2020). In relation to coastal hazards, urgent action is necessitated at a local scale, but these immediate actions must also align with a coordinated response of global proportions (Becker, Payne, & Paton, 2020). Coastal adaption is a wicked problem – it is a multifaceted, complex and contentious matter, in which there are no definitive solutions.

The interpretation and evaluation of coastal hazard risks is particularly involved when risk is examined in the context of the subjectivities of landscape value. Recognising there will be uncertainty around timing and the magnitude of potentially catastrophic effects from climate change, the evaluation of acceptable risk tolerances from coastal hazards alongside landscape valuation is a convoluted task (Thomas, Phillips, Lovekamp, & Fothergill, 2013). Coastal adaptation planning generates varying interpretations and perceptions of risk that are

fundamentally aligned to our relationships with society and our environment. This research specifically considers approaches to the identification and interpretation of coastal hazard risks in relation to landscape values, and how these assessments have been used to inform coastal adaptation planning in New Zealand (NZ).

1.4.1 Coastal Hazard Adaptation

Natural hazards impact coastal communities in variable and interconnected ways. Sea level rise, tidal changes, storm surges and increasing wind and wave intensities are contributing to an increase in natural hazard risks affecting coastal communities. Coastal hazard risks are physically altering events that result in changes to the familiar landscapes in which coastal communities' function and value. Coastal communities are irrevocably changed through erosion, land slippage, coastal inundation and flooding (Oppenheimer, et al., 2019). For a small island nation like NZ, coastal communities and low-lying settlements adjoining water bodies are the first and most noticeable areas to experience the physical effects of climate change induced risks (Hayward B. , 2008).

Coastal hazards irreversibly change the ways in which a community values and associates with their environment. Globally, there has been a growing compassion and recognition of the significant harm brought upon others from the catastrophic impacts of coastal hazard events (Wisner, Gaillard, & Kelman, 2011). Accounts of first-hand experiences of loss and increasing media coverage of affected communities have brought to the forefront, a public awareness and appreciation of the need for action in response to coastal hazards (Wisner, Blaikie, Cannon, & Davis, 2004). Communities have a significant role in adaptation to coastal hazards.

Adapting to coastal hazards requires the navigation of governance structures, cross-sector perspectives of risk and value, and alignment with political ideologies that can be polarising and contentious. Trans-disciplinary action is necessitated across all levels of governance, including input from locally affected communities (IPCC, 2023). The uncertainty around timing, and the magnitude of potentially catastrophic effects from coastal hazard risks complicates the evaluation of acceptable risk tolerances in coastal adaptation planning (Thomas, Phillips, Lovekamp, & Fothergill, 2013). While direct action is required at a local scale, the problem is of broad consequence and global proportions.

The strategic management of coastal hazard risks is a wicked problem as it is a multifaceted and complex area of land use planning and policy (Rittel & Webber, 1973, p. 160). Therefore, how risk is addressed in coastal adaptation planning is the first theme of this research.

1.4.2 Landscape Values in Coastal Adaptation

The assessment and evaluation of coastal hazard risks is further convoluted when they are examined in the context of subjective values. Values, in relation to land use planning and coastal hazard management, is a term plagued by subjectivity, compounding the wickedness of coastal adaptation planning (refer also to section 2.2.5). The long-term effects of climate change and the immediate impact of severe weather events can alter the attributes of our landscapes, which are valued for a multitude of reasons (Antrop, 2018). Due to the diversity of ways in which people and sectors assign value to nature and place, there are a multitude of landscape evaluation approaches amongst environmental planning practitioners.

Adapting to coastal hazards generates varying interpretations of risk and value (Rubooga, 2024). Intangible landscape values, including natural, social and cultural attributes, are inherited or connected to a place and can contribute to the reasoning and justification for or against a particular action towards coastal adaptation (Borrie & Armatas, 2022). The interpretation of intangible landscape values requires a deep understanding of a matrix of external influences that spans across scales of governance but only presents at a local level (Concha-Homes & Oliver-Smith, 2019).

Intangible values are not able to be revealed in isolation and must be deciphered through genuine community engagement. The influence of communities in the development and implementation of coastal adaptation plans is also significant (Pascual, et al., 2022). With varying conceptualisations of what is valued and of value, locally informed evaluation approaches are necessitated in coastal adaptation planning. Landscape values are not able to be revealed in isolation and must be deciphered through genuine community engagement (Misiune, Deoekkegrin, & Egarter Vigi, 2022). This research explores the varying conceptualisations and means of assessing what is valued and of value, in coastal communities.

1.4.3 New Zealand's Vulnerable Coastal Communities

Indirect vulnerabilities, including social and structural biases compound effects on communities from climate change induced coastal hazards (Begum, et al., 2022; IPCC, 2023). According to the IPCC (2023) "approximately 3.3 to 3.6 billion people live in contexts that are highly

vulnerable to climate change" (p. 5). The coastal environment of NZ is one of the first and most noticeable areas demonstrating the effects of climate change.

The communities most at risk of climate-induced natural hazards were identified as vulnerable communities, including indigenous peoples and communities in rural and remote low-lying flood plains or isolated coastal areas (IPCC, 2023). Communities that are vulnerable to coastal hazards are threatened with environmental change that fundamentally alters livelihoods. Effects and associated losses from coastal hazards are unequally distributed, with risk compounded by indirect vulnerabilities and social complexities (Begum, et al., 2022). For instance, the IPBES (2022) noted "the use of a restricted set of values of nature that underpins many development and environmental policies, is embedded in and promoted by societal norms and formal rules" (p. 11).

NZ has a population of 5.3 million (Stats NZ: Tatauranga Aotearoa, 2025), of which 15% of the population is comprised of indigenous Māori (Ministry for the Environment and Stats NZ, 2019). As noted earlier, more than 65% of the NZ population is located within 5km of the coast, and as Hennessy, et al. (2007) noted, "ongoing coastal development and population growth in areas such as Cairns and South-east Queensland (Australian) and Northland to Bay of Plenty (New Zealand), are projected to exacerbate risks from sea level rise and increases in severity and frequency of storms and coastal flooding by 2050" (p. 509).

While NZ is considered to have significant adaptative capacity and capability at a national scale, key barriers to implementation at the regional and local level include considerable economic and sector bias constraints (IPCC, 2023). The IPCC (2023) noted a particular concern for NZ is the impact that more high intensity rainfall from extreme weather events will have on vulnerable and isolated rural and coastal communities. There are pockets of vulnerable communities with lower adaptive capacities settled in remote rural and coastal areas "where the economy and social and cultural systems are strongly tied to natural environment systems" (Hennessy, et al., 2007, p. 522). These vulnerable coastal communities often have less resources and capability to adapt to climate change effectively. They are often at significant risk of adverse impacts from extreme weather events, as well as the long-term effects of sea level rise.

NZ has a relatively wealthy export-based economy that is largely dependent on its natural resources, particularly agriculture, natural tourism and cultural industries. These sectors can generally be described as climatically driven and consequently, climatically sensitive. With more extensive observation and understanding of the adverse effects of climate change on our

landscapes, "the *values* associated with these [natural] resources are likely to be adversely affected, including spiritual well-being and cultural affirmation" (Hennessy, et al., 2007, p. 522).

There is also an increased risk of damage to public infrastructure from extreme weather events that is exacerbated by the reality that much of the existing infrastructure across NZ, particularly within isolated and rural areas, has been under-funded and poorly maintained (Infrastructure New Zealand, 2023). Many lifeline infrastructure services, including roading, water and waste utilities were not designed to accommodate the level of growth being experienced, nor the increased frequency and intensity of weather events observed. Climate adaptation is further hindered by political indifference and the slow introduction of national direction and guidance documents, leading to reactive actions towards coastal adaptation planning (IPCC, 2023).

Coastal adaptation planning is a complex task, particularly in the context of the dynamic and uncertain futures presented by climate change. Coastal areas are particularly vulnerable to changes in the landscape which can raise risk to life, property and the economy (Wisner, Blaikie, Cannon, & Davis, 2004). Within NZ's coastal environment, both social vulnerabilities and physical risk factors must be considered in a manner that informs the prioritisation of action with regards to adaptation. Attributes of risk can be used alongside landscape evaluations to inform coastal adaptation planning and foster local community action. Proactive planning in coastal environments that integrates climate resilience, lessens the need for reactive responses to climatic events.

1.5 A Global Call for Climate Action

There are numerous objectives for coastal adaptation planning that are widely supported, or stem from global agreements on climate change. The 'Paris Agreement' is one such example; a legally binding international treaty adopted under the United Nations Framework Convention on Climate Change in 2015 (The Paris Agreement, 2024). The Paris Agreement was a catalyst to the rise in national ambitions to address the numerous and interconnected consequences of climate change. The IPCC (2023) Climate Change Synthesis Report noted that with almost universal participation, the Paris Agreement "led to policy development and target-setting at national and sub-national levels, particularly in relation to mitigation, but also for adaptation, as well as enhanced transparency of climate action and support" (p. 52).

Action towards climate adaptation planning has been slow coming, with global agreements only recently being observed to influence the direction of policy and planning responses. At least

170 countries now incorporate adaptation into strategic climate policy and planning processes at a national level, including Aotearoa New Zealand (IPCC, 2023). The IPCC Sixth Assessment Report (AR6) described a global undertaking of small-scale responses to climate change through incremental action, whereas there is little evidence of meaningful transformational work to address climate change adaptation. The AR6 (2023) report suggested a scaling-up of adaptation efforts is required globally.

The AR6 (2023) identified key barriers to the implementation of coastal adaptation mechanisms including:

- a lack of public or sector engagement.
- differing knowledgebases and education in relation to climate literacy.
- scientific research, funding, capacity and resourcing.
- religious or cultural practices.
- differing and often short-term political commitments.

Another global agreement with significance for coastal adaptation planning is the Sedai Framework of the United Nations Office for Disaster Risk Reduction (2015). The Sendai Framework for Disaster Risk Reduction 2015-2030 report, endorsed by the UN General Assembly, is a global framework that seeks to address the reduction of disaster risks, including coastal hazards. The agreement was adopted in 2015 by 187 United Nations member states, including Aotearoa New Zealand. It also calls for global action, stating that a multi-hazard approach is necessitated across both public and private sectors, all levels of governance and at a community level. Particularly relevant to this research, the Sendai Framework for Disaster Risk Reduction 2015-2030 report emphasized that acknowledgement should be given to the crucial role that communities play in the direction and implementation of coastal adaptation planning.

Globally, when planning for coastal adaptation, the concern has generally been focused on the effects of climate stressors on tangible physical assets. Discourse on traditional disaster response practices often described natural hazard events as ‘unpredictable’ and ‘disruptive’ forces, for which society is at the ‘mercy’ of nature (Thomas, Phillips, Lovekamp, & Fothergill, 2013). There was little consideration given to risk reduction and preparedness. However, contemporary discourse and practices are more responsive to uncertainty and acknowledged the indeterminacies of risk assessment. The shift in risk assessment practices is observed

throughout global attempts to govern climate change and natural hazard management, including coastal adaptation.

Both the Paris Agreement (2015) and the Sendai Framework for Disaster Risk Reduction (2015) advocated for strategies that incorporate risk-informed planning towards coastal adaptation. Although, Sesana, et.al. (2021) found little discussion on the identification and assessment of values in their literature review on climate change impacts on cultural heritage. They noted that there is, however, a developing body of research considering the impacts of climate stresses on non-tangible attributes of our environments, including landscape values and natural resources (Sesana, Gagnon, Ciantelli, Cassar, & Hughes, 2021). Values that both justify and legitimise necessary actions towards coastal adaptation.

1.6 Planning for Coastal Adaptation

Building on global frameworks for risk assessment, landscape values are what underpin local efforts to adapt to climate change and drive coastal adaptation. How we value our environment serves as a foundation to drive action (Glavovic & Smith, 2014). Therefore, understanding how to address risk, alongside landscape values, is necessitated in coastal adaptation planning.

Acting in advance of anticipated futures is an integral concept that underpins public-sector strategic planning (Anderson, 2010). Coastal adaptation planning is both future orientated and responsive to the current pressures and challenges that society faces (Scheller, 2020). It requires inclusion of notions of uncertainty and flexibility in relation to climate change. In the context of planning for multiple, dynamic, and uncertain futures, coastal adaptation planning has, traditionally, been a neglected practice. Scholarly literature implied that the absence of progress towards coastal adaptation is due to knowledge deficiencies, a lack of understanding of climate change and a fear of the unknown (refer to section 2.3). However, with improved technology, greater sharing of information, and advancing knowledgebases, the public sector is better enabled to prepare for multiple futures in the context of climate change and coastal adaptation planning.

How climate change scenarios are presented and managed in coastal adaptation planning processes is significant. Approaches to coastal adaptation are essentially conditioned by the ways affected communities anticipate and act towards a particular future or risk scenario. According to Anderson (2010), anticipatory action is enabled through our need to prepare for and prevent threats. Using anticipatory statements, planners can problematise the future in particular ways to evoke response.

Coastal hazard risks from climate change threaten irreversible changes upon our landscapes and livelihoods (IPCC, 2023), making it an important issue for planning in NZ. Hennessy, et al (2007) observed there is "more attention to the role of planned adaptation in reducing vulnerability and assessment of key risks and benefits" (p. 509). As the risks of coastal hazards are becoming more perceptible, there has been a call for action to 'protect' or 'control' undesirable changes to NZ's coastal environments. There are many existing policy frameworks and strategies in place directed to enhance coastal adaptation planning in the face of climate change (see Chapter 3).

The complexities that arise in coastal adaptation planning were observed by Rulleau and Rey-Valette (2017), their case studies focused on perceptions and preferences of communities in response to polarizing coastal adaptation strategies, including hard protection structures and managed retreat. They noted that responses of participants were framed around property values, ownership rights and uncertainties around effectiveness. Globally we require a shift in current 'acquired rights', and this requires action across global, national, and territorial scales (Rulleau & Rey-Valette, 2017). Somewhat antagonistically, Rulleau and Rey-Valette (2017) also stated that climate change itself has a negligible effect on property values, due to the long-range uncertainties associated with it. While property values often decline sharply in the immediate aftermath of an extreme event, there are nuances in the trajectory of recovery, with dependent factors such as public policy restrictions and insurance sector dynamics (Boustain, Kahn, Rhode, & Yanguas, 2020).

Society is experiencing a paradigm shift; a conscious reconstruction of the ways in which we value and relate to our environment (Misiune, Deoekkegrin, & Egarter Vigi, 2022). There is an evolution of international efforts towards a more expansive assessment of both landscape and societal values to inform risk assessment for coastal hazard management (Borrie & Armatas, 2022). This underscores the significance of exploring coastal adaptation planning from a territorial scale, with this research focusing on one example: The Takutai Kāpiti Coastal Adaptation Project.

1.7 Structure of Thesis

This chapter has provided an overview of the research context, situating the topic within coastal adaptation planning in NZ. The research question and objectives have focused on coastal adaptation planning at a local scale, to explore some of the contemporary approaches to risk

assessment and landscape evaluation in coastal adaptation planning. The remaining chapters are described below.

Chapter 2 presents a review of scholarly literature, providing context to the evolution of coastal adaptation planning practices, and explores key concepts related to the assessment of coastal hazard risks, informed by landscape values. It chapter introduces the complexities of coastal adaptation planning, before exploring the principal components of risk-based and value-based assessment in coastal adaptation planning. Chapter 3 sets out the institutional context of coastal adaptation planning in NZ. This is important because it situates the case study within the governance and institutional context for planning in NZ and highlights the relationship of national, regional and local authorities in managing the coastal environment.

Chapter 4 explains the research design, methodology and the means of collecting and analysing data to inform the research discussion. It describes how a document analysis was undertaken using publicly available data for a single case study: Takutai Kāpiti Coastal Adaptation Project. It is acknowledged that the use of single case study has limitations, and the reasons for this are also explained in Chapter 4. Chapter 5 discusses the findings of the qualitative document analysis and includes a summary of the assessments and participatory mechanisms used in the case study to elicit information on risk and value from the community.

In the concluding chapter of this thesis (Chapter 6), the research question is addressed. Insights from the case study are presented on the assessment of landscape values in the management of coastal hazard risks, through coastal adaptation planning. Recommendations for future research are identified, particularly in relation to the promotion of an ongoing dialogue with communities, and for planners involved in coastal adaptation planning.

Chapter 2

Understanding Risk Assessment and Landscape Values in Coastal Adaptation Planning

2.1 Introduction

This research explored intersections between two key tools of coastal adaptation planning: landscape evaluation and risk assessment. It critically considered the approaches used to inform climate adaptation planning in coastal communities. Coastal adaptation planning is growing as a critical field within the broader context of climate change resilience planning (IPCC, 2023). Globally, coastal communities are grappling with rising sea levels, storm intensities and other climate stressors, and policy makers face a complex task of balancing needs. There is increasing awareness of the dual challenges of risk management and value-based assessment in coastal adaptation planning (Kilvington & Saunders, 2019; Rubooga, 2024).

This chapter sets out the complexities of planning for climate change and specifically, the management of coastal hazard risks. Drawing on international scholarly literature, it begins by defining fundamental elements, including dynamic adaptive pathways planning, coastal hazard risks, maladaptation, vulnerability and landscape values. It then introduces the concept and complexities of coastal adaptation planning in practice, before looking in-depth at the principal components of risk-based and value-based assessment.

The purpose of this chapter is to address objective one of the research to explore how risk and landscape values are expressed and how they are used to inform coastal adaptation planning. This objective provides the means for experiences to be drawn from the case study, that will identify insights into the assessment of landscape values, alongside considerations of risk, in coastal adaptation planning. It examines the literature on how intangible values, including cultural, landscape and social values, have been assessed and the ways in which those assessments influence responses to coastal adaptation.

Particular attention is given to the intersection of two domains, perceptions of risk and value. It also explores how coastal adaptation planning takes places within a field of uncertainty, conflict and tension. Key themes and connections were identified from the literature, including the interplay of governance and power, vulnerabilities, risk tolerance and specific values of nature.

These themes are later used to develop a concentric framework, synthesizing the literature graphically, in order to undertake a thematic analysis of the case study documents.

2.2 Coastal Adaptation Planning

Building on the complexities of climate change (as discussed in Chapter 1), various approaches to coastal adaptation planning are explored below. Traditional approaches to coastal adaptation were framed across a scale of 'Advance - Protect – Accommodate – Retreat', with managed or planned retreat often considered as a last resort (Glavovic & Smith, 2014). Responses which vary in their positioning along the adaptation resistance spectrum can be used consecutively (Cooper & Pile, 2014), and can incorporate both hard and soft engineering solutions, "so named for their impact on the natural environment" (O'Donnell, 2022, p. 2).

These responses are discussed below, beginning with a contemporary approach to adaptation planning that responds to the dynamics of uncertainty presented by climate change and can encompass multiple dependencies: Dynamic Adaptive Pathways Planning. While each approach could be the subject of a thesis in its own right, the intent of this section is to introduce and define these approaches to provide a conceptual foundation for later discussions on coastal adaptation planning.

2.2.1 Dynamic Adaptive Pathways Planning

There are various means of achieving coastal adaptation through planning, and equal potential for maladaptation from inappropriate and short-sighted responses.Dynamic adaptive pathways planning (DAPP) is a multifaceted alternative pathways mechanism, that presents a collective mix of potential pathways and actions towards adaptation to climate change (Abeysinghe, et al., 2014). DAPP approaches include varying opportunities for different adaptation strategies, intersected by risk thresholds.

Abeysinghe, et al (2014) explained that long term solutions are identified as potential actions to be incorporated into a DAPP approach, while more resistive approaches with short term benefits are also included as options in DAPP, provided they are designed appropriately and include consideration for long-term outcomes.

Figure 1 below provides a visual representation of a potential adaptative pathways scenario for a coastal community. The figure illustrates different strategies and pathways applied to address coastal hazard risks, and the progression of these pathways over time, as transitions are made from one measure to another.

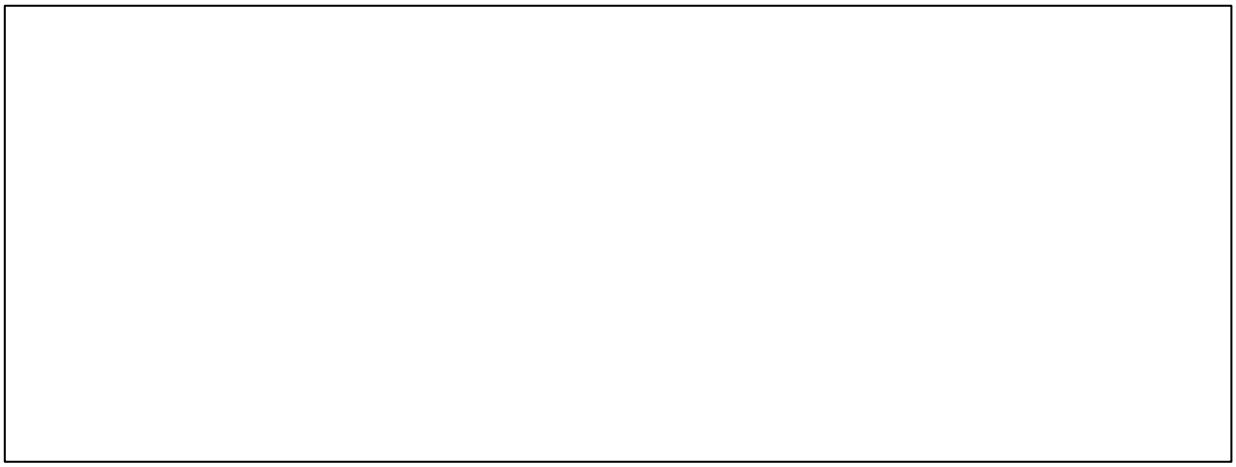

Figure 1: An example of a DAPP approach for coastal settlements (Source: Lawrence & Bell, 2024, p. 31)

2.2.2 Adapting to Coastal Hazard Risks through Nature Based Solutions or Retreat

Within the context of managing climate change risks, coastal adaptation refers to the strategic mechanisms and response measures undertaken to enhance the resilience of coastal communities under different scenarios of climate change (Lawrence & Bell, 2024). The resilience of communities located in coastal environments is related to the speed and ability of those groups to prepare and recover from disruption. The New Zealand Coastal Society (2022) explained that building resilience and adaptive capacity requires consideration of both "near-term and ongoing- mitigation and adaptation actions" (p. 3).

Adger, Hughes, Folke, Carpenter, and Rockstrom (2005) also noted that "adaptive capacity can be increased through purposeful action" (p. 1037). The broadly encompassing concepts of 'Nature-Based Solutions' and 'Retreat' are two commonly referenced approaches to coastal adaptation and are explored further in the following subsections. They align with 'Accommodation' on the DAPP adaptation scale (described above). At the other end of the scale, resistive actions such as reclamation and the use of hard protection structures have the greatest risk of maladaptation (Griggs, 2005).

Nature-Based Solutions

Nature-based solutions (NBS) is a contemporary term that captures a broadly encompassing collection of existing approaches to adaptation. *Te Mana o te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020* provides a definition of nature-based solutions as "solutions that are inspired and supported by nature, cost-effective, and simultaneously provide environmental, social and economic benefits and help build resilience" (NZ Govt, 2020, p. 62).

NBS includes ecosystem-based, green and blue infrastructure; in the coastal environment such as dune replenishment, beach re-nourishment and other approaches to land use management that are less likely to result in maladaptation (IPCC, 2023; Lawrence & Bell, 2024).

Planned or Managed Retreat

Planned and managed retreat are, according to Hanna (2019), essential strategic options available to address coastal adaptation in high-risk vulnerable areas. In the coastal environment, this involves the progressive relocation of communities and infrastructure landward and away from high-risk areas (Glavovic & Smith, 2014; Hanna, 2019). The means of how retreat is achieved presents the difference between 'managed' and 'planned' retreat; reliant on the position of affected parties, and how directly involved they are in promoting the strategy.

Forceable relocation of communities and infrastructure renders permanent landscape change that is generally not readily accepted by people (Hino, Field, & Mach, 2017). As Hino, Field, and Mach (2017) noted, "managed retreat is not a low-regrets option, nor is it easily reversed" (p. 1). Because of this, retreat is a politically polarizing, emotionally driven and contentious subject matter. The retreat of existing communities is often considered as a last resort; compelling only when all other options have been explored and the status quo cannot be accepted (Glavovic & Smith, 2014).

On the other hand, Hanna (2019) explained that planned retreat, when proactively and collaboratively implemented, can enable communities to relocate in a way that enables the preservation of cultural and social values and create opportunities for both resilience and regeneration. She noted that "retreat is inevitable in certain local and global environs - how it is delivered will determine the success of its outcomes and ultimately, the resilience of current and future generations" (Hanna, 2019, p. 2).

2.2.3 The Risk of Maladaptation

Contemporary narratives on coastal adaptation called for proactive adaptation management practices, in recognition that some reactive and resistant approaches can result in maladaptation over the long term. At the other end of the DAPP adaptation scale, resistive actions such as reclamation and the use of hard protection structures have the greatest risk of maladaptation (Griggs, 2005).

The term maladaptation refers to adaptation responses that lock-in vulnerability and exposure to risks that are difficult to change. Actions towards adaptation that focus on risks in isolation or on short-term gains, can lead to maladaptive outcomes over time (Griggs, 2005). The IPCC (2023) Summary for Policymakers stated that maladaptation can be avoided through the implementation of adaptation actions which hold multiple co benefits, and allow for flexibility in the face of uncertainty (IPCC, 2023). Actions of resistance, including the provision of poorly designed and inappropriately located hard protection structures are commonly referred to as maladaptive outcomes, as further discussed below.

Hard Protection Structures

The design and performance of hard protection structures are dependent on several dynamic, complex and technical variables, including water and tide levels, wind and wave intensity and the frequency and intensity of storm surges. Hard protections structures may effectively reduce impacts in the short term but can result in unwanted lock-ins of increased exposure in terms of long-range climate projections. Long-term, hard protection structures decrease the opportunity to build up a natural resilience, limiting the ability to provide for future adaptation (Kisacik, Ozyurt Tarakcioglu, & Cappietti, 2022).

Griggs (2005) described mechanisms for protective armoring, noting they differ in cost, size and lifespan, and their effectiveness and impact on our coastal environments varies. He observed that impacts can include visual and amenity effects and changes to coastal processes, which in turn can affect other landscape values, such as ecology. As understandings of hard engineering solutions have evolved, alongside documented observations of the effects of coastal protection outcomes, the coastal engineering sector has come to acknowledge that in most instances, hard protection structures are 'maladaptive' responses (Cooper & Pile, 2014). The literature showed that over time, despite immediate short-term benefits, hard protections structures are more likely to exacerbate existing inequities and vulnerabilities within communities.

While it is generally accepted that new hard protection structures should be discouraged, Kisacik, Ozyurt Tarakcioglu, and Cappiett (2022) acknowledged that we must also address existing structures. They noted "the development of innovative coastal protection systems, or adaptation measures of existing structures is necessary" (p. 2). When considering long-term options that involve the redevelopment or reconstruction of existing hard protection structures, changing design conditions in the environment should be accommodated. This should include an assessment of the impact of environmental changes on recreational use and other societal values associated with the area, in its current state, should also inform coastal adaptation options (Adger, Hughes, Folke, Carpenter, & Rockstrom, 2005). For example, Kisacik, Ozyurt Tarakcioglu, and Cappiett (2022) describe how increasing the crest height of an existing rock revetment seawall may be an option, but it can also limit the recreational function of the foreshore edge and impact on character, or raise environmental or cultural issues.

As mentioned in section 2.2.1, DAPP allows for the inclusion of both long and short-term pathways to mitigate coastal hazards and shift from a state of resistance towards adaptation. Knowledge of the effectiveness of hard protection measures is a key contributor behind an individual's decision to support, financially or otherwise, the implementation of hard protection structures in coastal adaptation planning (Narayan, et al., 2020). If resistive measures are to be used, they must be applied alongside alternative long-term adaptive planning initiatives, to prevent or mitigate maladaptive outcomes (IPCC, 2023).

Avoiding Maladaptation

The Sixth Assessment Report of the IPCC suggested "maladaptation can be avoided by flexible, multi-sectoral, inclusive, long-term planning and implementation of adaptation actions, with co-benefits to many sectors and systems (p. 19). Kisacik, Ozyurt Tarakcioglu, and Cappietti (2022) said the attenuation of foreseen impacts of climate change, including avoiding maladaptation, is challenging in the context of coastal adaptation, but it is a challenge that planners must accept as facilitators of change.

As explored further in section 2.3.2, the scale of action required to address coastal adaptation necessitates support from national governance, to provide guidance and facilitate resourcing (Narayan, et al., 2020). While there is evidence of a growing appreciation for NBS in coastal adaptation settings, the examples are generally small-scale with little observation of national resourcing for implementing coastal adaptation. They are described as 'bottom-up' approaches, harnessed through local community and indigenous input (IPCC, 2023).

Despite observed progress within the coastal adaptation sector, the Sixth Assessment Report of the IPCC (2023) acknowledged that "most observed adaptation responses are fragmented, incremental, sector-specific and unequally distributed across regions" (p. 8). It is acknowledged that some adaptation options, which may be considered feasible and effective now, "will become constrained and less effective with increasing global warming … losses and damages will increase and additional human and natural systems will reach adaptation limits" (IPCC, 2023, p. 19). Coastal adaptation planning requires a shift away from reactive and short-term responses towards more proactive integrated approaches that work with natural systems to build community resilience.

2.2.4 Factors of Vulnerability and Resilience to Coastal Hazards

Coastal hazard risks refer to the likelihood of a natural hazard occurring, together with the scale of associated adverse effects on both people and the environment (Milanović, 2019). The scale of risk depends on exposure to coastal hazards, including high intensity weather events, erosion and storm surge inundation, as well as other external vulnerabilities such as the way we value our environment. How a community perceives risks impacting the things that they value within their environment, fundamentally drives what is protected in coastal adaptation planning. With effective planning and proactive management, the level of risk and the impacts of coastal hazards can be reduced (Institute of Geological and Nuclear Sciences Limited, 2021). Recognising vulnerabilities and building resilience into communities are interrelated subsets of coastal hazard risk management, as further explored below.

The Compounding Factors of Vulnerability

In coastal adaptation planning, vulnerability refers to the susceptibility of both the built and natural environments, and people and communities to harm from coastal hazards (Fekete & Montz, 2018). Vulnerability as a broad term, is conceptualised differently across varying sectors and disciplines. While the underpinning concept of vulnerability is commonplace, it can represent a diversity of meanings depending on context (Hennessy, et al., 2007; Sun, Gao, Gong, & Wu, 2020). This adds complexity to the interpretation of vulnerability (Thomas, Phillips, Lovekamp, & Fothergill, 2013).

Wisner, Blaikie, Cannon, and Davis (2004) explore the multiple meanings of 'vulnerable' and defined it as, "the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (an extreme natural event or process)" (p.11). They highlighted the drawbacks of early approaches

to risk management which focused on the social, economic and political processes that make people vulnerable. Traditional approaches to risk management were often without consideration of 'capability' (Wisner, Gaillard, & Kelman, 2011).

Uekusa & Matthewman (2017) noted it is crucial for planners to understand the context of vulnerabilities within a community and recognise that there are a multitude of conditions and circumstances that influence vulnerability to natural hazards. Thomas, Phillips, Lovekamp, and Fothergill (2013) detailed the intersecting factors of social normality and discrimination in risk management and noted there are several compounding factors of vulnerability to coastal hazard risks. In addition to other scholarly literature, the following factors of vulnerability have been identified:

- Exposure to risk through environmental settings, such as existing land use patterns (Wisner, Gaillard, & Kelman, 2011; Concha-Homes & Oliver-Smith, 2019).
- The degree of sensitivity to the effects of coastal hazards, including the quality of public infrastructure and housing, and financial security (Wisner, Gaillard, & Kelman, 2011; Becker, Payne, & Paton, 2020).
- Adaptive capacity of individuals and communities to prepare and recover from the impacts of coastal hazards (Fischer, 2000; Wisner, Blaikie, Cannon, & Davis, 2004).
- Social and economic factors including availability of resources, knowledge and understandings (Thomas, Phillips, Lovekamp, & Fothergill, 2013; Uekusa & Matthewman, 2017).

In a coastal adaptation setting, vulnerabilities, including social susceptibilities, can be represented on a scale that can be used to inform risk assessment and the prioritisation of actions (Concha-Homes & Oliver-Smith, 2019). Social vulnerability may be used in coastal adaptation planning as an indicator of the social processes that influence and contribute to one's ability to mitigate, respond and recover from adversity (Thomas, Phillips, Lovekamp, & Fothergill, 2013). It is useful as an index, assisting to identify and prioritise programs of work to reduce coastal hazard risk.

Enhancing Resilience

The concept of resilience is underpinned by considerable complexity and ambiguity, with varying definitions across disciplines and contexts. Alexander (2013) explored the etymological development of resilience from engineering to "ecology and psychology" and noted "the modern conception of resilience derives benefit from a rich history of meanings and

applications" (p. 2707). Despite this diversity, this study adopts the following working definition, as it best supports the analytical focus of the research.

Resilience, when referring to coastal adaptation, means the capacity to withstand, and the rate of recovery from coastal hazard risks and events (Oxford University Press, 2023). Scheller (2020) described a resilient landscape as "one that recovers its landscape values and identity following a more substantial pulse driver" (p. 24). In the same manner as vulnerability, it is recognised that some people and places are less resilient to the impacts of coastal hazard events than others.

Every person possesses some kind of capacity and capability to adapt to anticipated risks, and the resilience of vulnerable communities can be enhanced (Wisner, Blaikie, Cannon, & Davis, 2004). An example from Thomas, Phillips, Lovekamp, and Fothergill (2013) included the collective determination of ways to strengthen community assets, capacities and interests. They suggested this can be achieved through means of social inclusion, education and community. By addressing factors of vulnerability, planners can enhance a community's capability to withstand, recover and adapt to coastal and natural hazard risks (IPCC, 2012).

2.2.5 Specific Values of Nature in Coastal Adaptation Planning

Understanding landscape values is essential in the context of coastal adaptation planning, as these values shape how communities perceive coastal hazards and engage with risk management strategies (Rubooga, 2024). The IPBES (2022) also that a multitude of values can lead to a diversity of outputs in terms of landscape evaluation. When determining coastal hazards, it is important for planners to seek an understanding of the landscape values that can influence how communities perceive and respond to risk. Landscape values are broadly defined as the particular or unique characteristics of a place that hold significance to individuals or a community (Pettenati, 2023). In support of this definition, Cassatella and Peano (2011) provided a defintion of landscape which is grounded on the concept of perception and value attributes. They noted "Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and human factors" (p. 3).

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (2022) framework also detailed 'specific values of nature'. These nodes of value are relational, intrinsic and instrumental, and are multifaceted. As illustrated in Figure 2 below, these values of nature are interconnected with world views and knowledgebases, relational and

wellbeing attributes and how we care for our environment (Pascual, et al., 2022). The diagram highlights specific and broad values of nature, within a values typology framework.

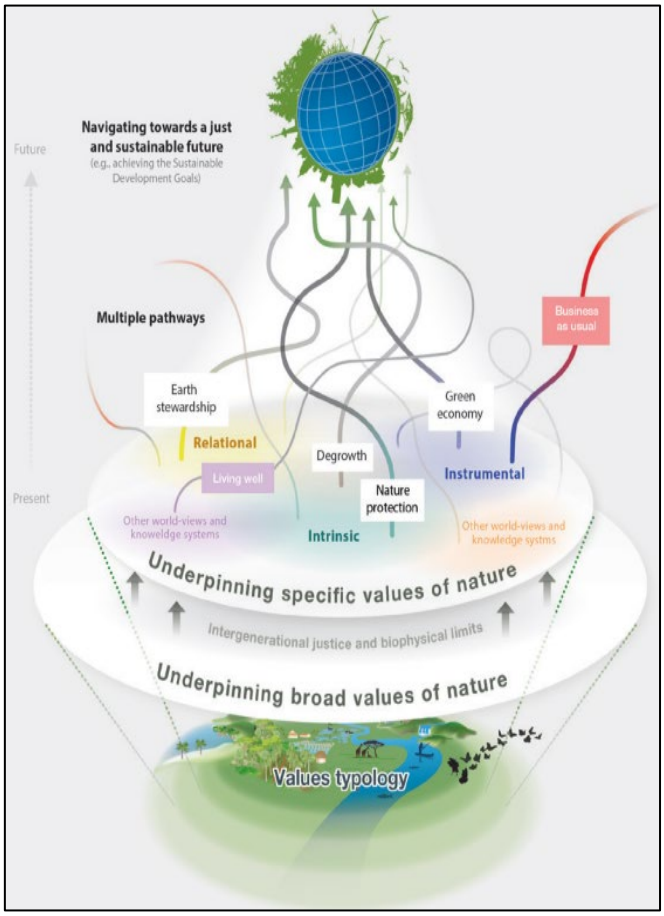

Figure 2: The values of nature underpinning multiple pathways towards sustainability (Source: IPBES, 2022, p. 10)

For this research, four typologies, or 'specific values of nature' are explored that fall under the broader framework of intangible, intrinsic and relational values. These include heritage and cultural values, experiential and social values, intangible natural values such as natural character and intrinsic values, including natural resources and eco-services. These specific values generally align with the broader framework of value typologies developed by the IPBES (2022) and are explored further in the following subsection.

Intangible, Intrinsic and Relational Landscape Values

Physical attributes of landscapes are more easily identified and able to be quantified than intangible, intrinsic and relational value attributes. The Oxford English Dictionary (2023) defines something *tangible* as being "discerned or discriminated by the sense of touch", whereas *intangible* means "incapable of being touched; not cognizable by the sense of touch". In

addition, *intrinsic* is defined as "belonging to the thing in itself, or by its very nature; inherent, essential, proper; 'of its own". Throughout this research the term 'landscape values' is often referred. Landscape values are the aspects of our natural environment that offer intrinsic and often intangible benefits and functions. For this research, intangible, intrinsic and relational values is a term used to broadly encompass specific values of nature including:

1. Heritage and cultural values,
2. Intrinsic natural values such as natural character,
3. Experiential and social values, and
4. Natural resources and eco-services values

While less quantifiable than physical features, they have an influential role in shaping how communities perceive and respond to coastal hazard management strategies in coastal adaptation planning (Pettenati, 2023). Landscapes are valued for many reasons, with multiple interdependencies between people and nature (Cassatella & Peano, 2011; Scheller, 2020). The preservation of specific nodes of intangible, intrinsic and relational landscape values, as described in the following subsections, is critical in the promotion of sustainable development and to support well-being (Pascual, et al., 2022).

1. Heritage and Cultural Values: Mātauranga Māori

Pertinent to this research, and specific in the context of NZ, are cultural values such as Mātauranga Māori. The concept of 'Mātauranga Māori', defined by Mead (2012) as, "Māori knowledge in its widest and broadest terms" (p. 11) is of particular interest to this research. In the context of the bicultural planning system that operates in Aotearoa New Zealand under the Resource Management Act 1991 (RMA, refer also to Chapter 3), it is necessary for planners to make genuine efforts to understand cultural values. Equally significant, the Treaty of Waitangi (Te Tiriti o Waitangi), is a founding document of NZ, signed in 1840 between Māori and the British Crown, it mandates a partnership approach and the protection of Māori rights, values and knowledge.

Matunga (2000) highlighted the significance of incorporating Mātauranga Māori into planning processes in NZ and describes how Mātauranga Māori includes shared beliefs, customs, traditions, and moral principles transmitted from generation to generation. Mātauranga Māori resource management knowledge systems are based on customary and traditional cultural practices passed on and exercised by mana whenua, through their role as kaitiaki (guardians) of Papatūānuku (the land, earth mother) (Gooder, 2018; Environmental Protection Authority:

Te Mana Rahui Taiao, 2020). The recognition and provision for Mātauranga Māori in NZ planning systems is supported by Distinguished Professor Sir Hirini Moko Mead (2012) who described the inclusion of Mātauranga Māori as "a way to view the world that reinforces positively Māori culture and contributes to the identity of all New Zealand citizens" (p. 10). The understanding and recognition of Mātauranga Māori, and the ways in which it may be applied in contemporary planning settings across NZ is continuously evolving.

In the planning profession there is a growing recognition and appreciation for the critical partnership with Māori that stems from Te Tiriti o Waitangi, alongside the value and influence that indigenous knowledgebases can offer in environmental planning practices (Mead, 2012; Macfarlane, Derby, & Macfarlane, 2024). When heritage and cultural values are acknowledged through meaningful participation and inclusive engagement processes, coastal adaptation outcomes are locally appropriate, and more likely to be accepted by affected communities (Pettenati, 2023).

2. Intrinsic Natural Values: Natural Character

Adding complexity to the use of any definitive terms of landscape value is the interpretation of natural character. Boffa Miskell's (2019) report on natural character assessment noted that "the meaning of the term 'natural character' has been a matter of evolving interpretation" (p. 9) in NZ planning. The RMA 1991 prescribes the natural character of the coastal environment as a matter of national importance that requires preservation and protection (refer also to 3.2.1). This is supported by the New Zealand Coastal Policy Statement (2010) (NZCPS, see also 3.2.4) which defines the extent and characteristics of the coastal environment and attributions of natural character, features and landscapes.

Despite a hierarchy in legislated matters of national importance, natural character' has not been defined in the RMA 1991. Instead, the meaning of natural character has been tested through NZ caselaw. For example, the 1994 case: *Environmental Defence Society v Mangonui County Council* attempted to reconcile a number of interpretations of natural character. This case referred specifically to an earlier, precedent setting case: *New Zealand Rail v Malborough District Council* which refined the protection of natural character as, "not protection of the things in themselves, but insofar as they have a natural character" (High Court Wellington AP 169/93; 4 November 1993 Greig J; 18-19). Given that the subjectivities of the term natural character remain prevalent, it is important that planners understand how communities themselves interpret landscape values for the purpose of informing coastal adaptation planning.

3. *Experiential and Social*

Landscapes have a multifaceted role in human society, providing various net public benefits including social and experiential values. Social values attributed to landscapes include the fostering of community cohesion, social identity, cultural continuity (Borrie & Armatas, 2022). Wellbeing and quality of life can be enhanced through experiential, recreational and resource opportunities provided by landscapes (Chiesura, 2003; Potschin, et al., 2016).

Relational values associated with our natural environment are dynamic. They have different connotations for different people. Concerning heritage and cultural landscapes, Pettenati (2023) noted:

> "The most commonly cited characteristics of traditional (and particularly of indigenous) knowledge systems include their holistic nature, lengthy acquisition, culture-specific embeddedness, the use of local skills, resources and materials, informality, explanations based on examples and parables (often using religious examples), experiential familiarity, and close relation to survival and subsistence" (p. 92)

He highlighted the complex and diverse nature of values assessment in relation to cultural and heritage attributes and the interrelation of these attributes, with other notions of relational value, including social and environmental.

As with cultural values and natural character values, there remains a predisposition to subjectivity and perception that can be attributed to ambiguous interpretation. Lowenthal (1978) explains simply, "the reason landscapes are thought to be preferred, are equally various" (p. 3). Relational values are generally locatable, tangible and place-based; they are both contextually dependent and situationally constructed (Borrie & Armatas, 2022). Hence, the identification and interpretation of experiential and social values associated with coastal landscapes is a complex task that can only be informed by those most closely associated with the area.

4. *Natural Resource and Eco-Services*

The coastal environment provides an array of both natural resource values and ecological services and there are multiple interdependencies between people and nature that must be addressed through adaptation planning (Borrie & Armatas, 2022). Landscapes support biodiversity and provide buffers against storm surge and erosion through natural features such

as dunes, wetlands and mangroves (Rulleau & Rey-Valette, 2017). Beyond tangible ecological functions, landscapes also provide for social well-being and economic resilience through the provision of natural resources such as water, mahinga kai and tourism (Misiune, Deoekkegrin, & Egarter Vigi, 2022). Recognising and integrating landscape values into coastal adaptation planning practices ensures strategies not only protect people from coastal hazards, but also seeks to address socio-economic, environmental, well-being and cultural concerns.

2.2.6 Coastal Adaptation in Practice

Literature on managed retreat of coastal communities and NBS to address coastal hazards provided a brief insight into the realities of implementing coastal adaptation planning strategies. However, with little action in this space globally, Rulleau and Rey-Valette (2017) suggests there are "not sufficient insights, as to the social constraints concerning these operations" (p. 14). There remains gaps and inconsistencies when it comes to mitigation and adaptation responses in coastal adaptation planning, across nations, regions, and sectors (IPCC, 2023). Despite the slow progress of coastal adaptation planning efforts, there is a developing body of research on the observed effectiveness of adaptation options, particularly those that take advantage of natural processes, including NBS and planned or managed retreat (refer to 2.2.2).

Regarding NBS, Misiune et al. (2022) described working with nature as a promising approach which addresses complex societal challenges, where resilience is improved alongside a range of environmental benefits. They provided examples of NBS, including the enabling of healthy ecosystems, such as mangrove or dune environments, in locations that protect infrastructure from erosion and form physical barriers of protection from storm surges, while simultaneously providing ecological benefits.

Only a limited number of examples of long-term retreat of whole coastal communities were identified from the literature. Examples of managed retreat collated by Rulleau and Rey-Valette (2017) exemplified strong resistance to adaptive strategies from two typologies of people: recent un-informed new-comers, and older generations. In their research, older generations were described as those who struggle to accept climate change, or held a long-standing connection to place, with increased vulnerabilities generally, including health and financial constraints. Narayan, et al. (2020) also contended that retreat remains a "highly unpopular adaptation response, and difficult to implement, as coastal communities … indicate a strong place attachment and are deeply embedded in their social and natural environment" (p. 199). Whilst Rulleau and Rey-Valette (2017) observed a reduced scepticalness of the long-term

benefits of retreat. The concept of planned retreat requires a paradigm shift in our understanding and appreciation of coastal dynamics, and our ability, or 'right', to control such environments.

The research demonstrated a preference for long-term solutions, including planned or managed retreat and NBS to be implemented at a large scale. Thomas, Phillips, Lovekamp, and Fothergill (2013) noted that most people perceive the financial implications of managed retreat and scaled NBS to be a matter for the State. Examples of large-scale coastal adaptation responses promoted the 'net public benefits' offered by a proposal, as opposed to impacts on individual or private property rights (Rulleau & Rey-Valette, 2017). Raising the significance of net public benefits reinforces the notion that strategies such as managed retreat and large scale NBS should be a nation-wide and government-led responsibility.

As explored in section 2.2.4, marginalized and vulnerable communities, including isolated and indigenous communities, are most at risk of maladaptation from limited or biased solutions towards coastal adaptation (IPCC, 2023). Narayan, et al (2020) noted that regardless of scale or type, coastal adaptation efforts "are constrained at the local scale, by local needs and constraints" (Narayan, et al., 2020, p. 200). They observed that having less financial capital, resources, or capability meant vulnerable communities often have to rely on others, and this can result in poor outcomes that are fundamentally, maladaptive.

The research showed that innovative and boutique solutions can still be implemented in coastal adaptation planning, to manage difficult or vulnerable groups. For instance, a 'Deferred Purchase Agreement' is one solution that seeks to manage older generations through retreat, in a more equitable manner; enabling interventions to be postponed to a point of property transfer, or as otherwise agreed (Rulleau & Rey-Valette, 2017). This again underscores the need for localised knowledge and input into coastal adaptation planning, to ensure that responses are appropriate and applicable, in the context to which they apply.

Coordinating coastal adaptation planning is a complex task. Melnick (2009) explained that "accepting inherent change in the landscape on the one hand, and the preservationist's desire to limit change on the other … present us with a set of contradictions and quandaries" (p. 38). Addressing some of the complexities of coastal adaptation planning, Rulleau and Rey-Valette (2017) noted "it is important to identify and better understand barriers and resistances [to coastal adaptation] … since they may relate to preference for current policies and the low level of awareness about their drawbacks" (p. 17). Building adaptive capacity within vulnerable coastal communities is "strongly influenced by local social and cultural considerations and the

availability of natural resources" (Narayan, et al., 2020, p. 200). Therefore, to build resilience to coastal hazard risks through coastal adaptation planning, planners need to understand the underpinning perceptions of risk and landscape value that fundamentally influence a community's willingness to participate and accept adaptation responses.

2.3 Risk-Based Assessment in Coastal Adaptation Planning

When planning for coastal adaptation, one of the key topics of note from the literature is the relationship of risk exposure and risk thresholds or tolerances in risk-based assessment. Building on the definition of coastal hazard risks above (i.e. section 2.2.4), this section explores what is meant by risk exposure, and how the assessment of risk has evolved to address differing subjectivities and perceptions.

Risk-based assessment is a key aspect of planning for climate change and coastal adaptation (Weinkle & Pielke, 2017). Within the literature on natural hazard management, various scholars suggested that risk-based assessment should not be limited to the production of probabilities of occurrence and the physical scope and scale of harm; the assessment of risk also requires an understanding of vulnerabilities, perceptions, different knowledge systems and subjectivities of value (Tierney, 2014; Rubooga, 2024). As Beck (2006) explained, risk "is a socially constructed phenomenon in which some people have a greater capacity to define risk than others" (p. 333).

This review of literature on risk assessment practices shows there are significant connections between risk tolerance and public acceptability. Four significant topics emerged in relation to risk-based assessment, each offering insights into the practice of coastal adaptation planning:

1- The evolution of risk-based assessment towards more inclusive practices.
2- Power and governance in the management of risk.
3- Addressing differing knowledges and subjectivities of risk, including uncertainty.
4- Social vulnerabilities in coastal adaptation planning.

Each of these topics is explored further below, along with a final subsection which explores how risk-based assessment is used in coastal adaptation planning to address both the individual and cumulative impacts of coastal hazards.

2.3.1 Evolving Risk Based Assessment: Inclusive and Comprehensive Practices

Risk-based assessment has been evolving towards more inclusive and all-encompassing practices to mitigate conflict and avoid public cynicism. Chapter one explored coastal hazard risks and described the shift in approaches to coastal hazard management when applied against the adaptation resistance spectrum. Sun et al. (2020) showed that coastal hazard management has moved from a place of reactionary responses, towards one that espouses proactive measures of risk reduction. DAPP was identified as a contemporary approach to coastal adaptation planning that is flexible in the face of uncertainties.

Within coastal adaptation planning, there is a growing emphasis on integrating risk analysis frameworks that examine the relationship between risk exposure and community tolerance. Contemporary approaches such as DAPP integrate tools such as multi-criteria decision analysis and real options analysis, to support decision making (Lawrence, Bell, & Stroombergen, 2019). As a result, there has been a shift in awareness of the influential relationship that individual subjectivity, perception, and social vulnerabilities can have on the determination of risk tolerance thresholds (Glavovic & Smith, 2014; Concha-Homes & Oliver-Smith, 2019).

One complication from risk evaluation is that "numerous biases inherent in risk representation" (Rulleau & Rey-Valette, 2017, p. 13). For example, Lupton (1999) referred to a 'conventional-naïve-realist' conceptualisation of risk, in which risk is described as a "product of probability and consequence" (p. 25). An approach to risk assessment of this nature relies on scientific and technocratic input to methodically quantify risk scenarios that are easily legitimised through data (Lupton, 1999). It does not give due consideration to the subjectivity of personal values, worldviews, nor individual objectivity (Lupton, 1999; Thomas, Phillips, Lovekamp, & Fothergill, 2013). Another complication of risk assessment is when determinations of risk are treated as objective facts of truth, predetermined and able to be controlled. As Wisner et al. (2011) noted, this model can present a narrow and politically stylised view of risk, generally aligned to broad market and political interests. This is another technocratic approach which appeals to societal expectations of truth and logical reason.

Both Lupton (1999) and Rulleau and Rey-Valette (2017) make significant connections between risk assessment and public acceptability. Lupton (1999) explored early theoretical approaches to risk-based assessment and observed how they have evolved to address individual subjectivities. She advocates for coastal hazard management practices that incorporate a framework in which multiple subjectivities are accommodated. The authoritative nature of

technocratic knowledge production is eroding and there remains an enduring reliance on quantitative approaches to risk assessment; they are entrenched in the implied assumptions of legitimacy and authority afforded by science (Lupton, 1999; Rulleau & Rey-Valette, 2017). A readily accepted limitation of risk assessment is the lack of consideration for ambiguity faced by modelers developing climate change risk scenarios. Complexities include uncertainty of the range and magnitude of climate change projections, the effectiveness of adaptation responses, and individual perceptions of value and loss (Weinkle & Pielke, 2017).

These days, with the privatization and privileging of professional and expert knowledge, the exclusivity of participation is viewed objectionably, acknowledging its effects on social vulnerability (section 2.3.4). Weinkle and Pielke (2017) recognised that "defining risk, as many researchers have concluded, requires integration of objectives, norms, worldviews and political power" (p. 566). The observed shift in epistemology demonstrated a surgency of attention to the value of 'nonacademic' or laypersons knowledge in risk-based assessment practices, for instance, Lupton (1999) stated that "subjectiveness is an inevitable element of human judgement, … [and] therefore, technical risk assessment is not value-free" (p. 28). The assessment of risk requires more than tangible attributes, and this requires localised and comprehensive engagement with affected communities.

Lupton (1999) noted that conflicts will generally emerge by way of public cynicism when communicating or transferring information about risk to communities. She suggested this could be out of distrust of the information or objective facts being presented, or as the result of an internal conflict with subjective understandings and personal objectives. Incorporating local knowledge to enhance quantitative models for risk assessment is significant (Fischer, 2000; Ottinger, 2010). To proactively address and mitigate cynicism and conflict, a multi-sector and cross-scale approach is necessitated, particularly when seeking holistic and equitable outcomes (Concha-Homes & Oliver-Smith, 2019).

2.3.2 Power and Governance in the Management of Risk

The second theme explored in this section are the underpinning notions of power and governance in risk assessment. This section explores the interrelationship of power and governance in relation to risk assessment and highlights the influential role of planners, empowering communities through inclusionary practices. The role of the State in risk assessment, inclusionary planning practices and net public benefits are considered in the following subsections.

Present day society increasingly operates around notions of risk that are, essentially, a product of anthropogenic influence and power. When considering the scale and complexity of global problems such as climate change and social vulnerability, which have varied and localised impacts, the ability to hold individuals accountable is difficult (Melnick, 2009). So, while societal norms may call for accountability and responsibility in the production of risk, it is difficult to externalize accountability of an issue that is of such global scale (Tierney, 2014). The scale of the problem alone reaffirms the need for multi-sector and cross-scale measures to address coastal adaptation planning, as previously identified in earlier sections.

Within the literature explored on the management and responses to natural hazard disasters are debates on the prevention of and proactive management of risk. However, society itself is limited to its claim of control over nature (Concha-Homes & Oliver-Smith, 2019). The intricacies of risks associated with climate change, particularly when faced with measures of uncertainty, requires planners to operate across scales of governance and bridge nodes of action by empowering communities (Anderson, 2010). Tierney (2014) explored the perceptions and preferences of communities involved in coastal hazard responses. Her observations indicated a strong admission of support for the 'State' as the preferred mechanism for the funding and implementation of coastal adaptation planning (Tierney, 2014).

The Role of the State in Coastal Adaptation Planning

Directives and guidance that enable broad outcomes or ideals naturally come from a Nation or State level. However, the development and implementation of policy and planning mechanisms is undertaken at a regional and/or local-community level (Tierney, 2014). Planners should be empowered by recognising that higher order directives and guidance can only be realised when they are legitimised and enabled for at a local level. Hall (2022) stated that "local government is at the forefront of adaptation, given its legislated responsibilities" (p. 11). Hence, the notions of power and governance are inherently central to the role of planners practicing coastal adaptation, in NZ.

Figure 3 illustrates the centralization of power and governance within a concentric framework for risk assessment in coastal adaptation planning.

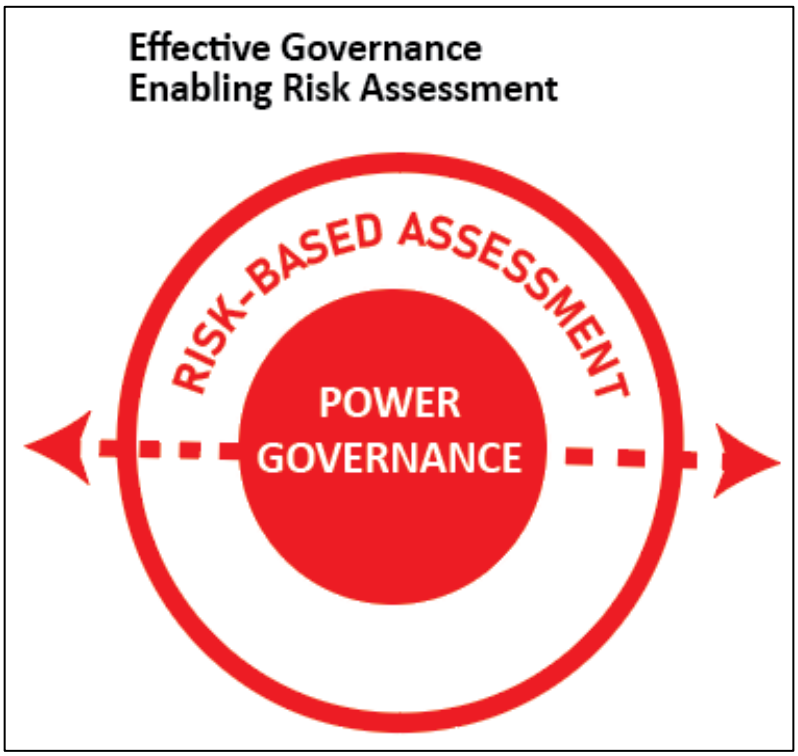

Figure 3: Power and Governance is central to enabling CAP (Source: Author's own)

In NZ, the RMA 1991 is a hierarchical planning system in which regional and district planning and policy outcomes must align with national directives, including the NZ Coastal Policy Statement (refer section 3.2). Kamete (2011), though not specific to NZ, described the practice of planning as a 'governmentality' of practices that shape communal strategies and the actions of individuals. He wrote that planning involves the production of governing structures that can invoke political agendas and are generally reflective of the ethical standards of a time.

Planners have a fundamental role as key facilitators in the development and implementation of regional and district planning initiatives throughout NZ (Ericksen, Berke, Crawford, & Dixon, 2003). Because coastal adaptation strategies can align with contentious and often polarising directives, such as managed retreat and planned relocation, community participation is necessary. Building on the insights presented in section 2.3.1, this would give legitimacy to coastal adaptation responses through the inclusion of local level knowledge and representation.

Inclusionary Planning Practices in Risk Assessment

Having established the role of the state and community in coastal adaptation planning, the concept of power is further addressed through an exploration of inclusionary planning practices that can enable coastal adaptation planning. The differential treatment of people and communities in planning practice is influenced by relations of power and knowledge. Inequalities in the evaluation and assessment of risk enables actors in positions of power to

materially prioritise the benefit of some, and loss to others (Beck, 2006). Thomas, Phillips, Lovekamp, and Fothergil (2013) suggested that inappropriate planning practices can result in exclusivity of knowledge and participation (refer section 2.2.4).

Operating within inequitable social structures and systems, unjust and inequitable power relations can result in adverse planning outcomes, with differential impacts on vulnerability and resilience across society (Kamete, 2011). As beck (2006) suggested, risk exposure' may be the 'principal inequity' of modern societies; concepts of class and social status, distinct of a first-modern society, reclassified to accommodate vulnerabilities and risk exposure. Building on some of the findings of section 2.3.1, Kamete (2011) observed that exclusionary planning practices can lead to policy outcomes that are perceived as unethical and contemptuous within the context of a democratic society. He also noted, conversely, that through strategy, policy and plan making, planners can also contribute to the fostering of *positive* social structures and standards that can fundamentally enhance capabilities and resilience (Kamete, 2011).

Planning practice is presented as a form of rationalisation, produced through the exercise of power. Risk evaluation and prioritization involves a "hidden politics, ethics and morality of expert thinking and political discourse" (Beck, 2006, p. 332). Forester (1989) was one of the first theorists to acknowledge the nature and relationship of power in planning systems. He explored how effective negotiation of power and conflict in planing practice can contribute to greater outcomes. Forester's approach resonates with the early literature of Foucault (1982) and Flyvbjerg (1998) who amplify the importance of the relational aspect of power and resistance; as a significant tool in seeking effective planning outcomes. An influential political theorist, Foucault (1989) advocated for a redefinition of the social, state, and scientific order of powers, conventionally tasked with defining risk on behalf of others. While appreciating Flyvbjergs (1998) reflection on the cynical side of planning; it is possible to identify positive forms of power at play within a planning system (Kamete, 2011).

The relations of power in planning practice can be positively reorientated to enable more forms of pastoral power and net public benefits. Pastoral power is a concept used in political and sociological contexts to describe the exercising of power through care and responsibility (Hubert & Rabinow, 1982; Kamete, 2011). For example, Kamete (2011) on the exercise of power in adaptation planning noted, meaningful engagement with people outside of the 'formal urban order' [allowed] the marginalised and excluded a chance to negoitate with authorities, while simultanously affording the authorities deeper insight into the spaces of the other" (p.

84). In NZ, planners operate within a systematic framework of relations of power and knowledge. Essentially, they are facilitators of negotiation across the different levels of governance. When planners use more inclusive practices in coastal adaptation planning, they are more likely to achieve net public benefits.

Net Public Benefits

The IPCC (2023) report noted the term net-public-benefit (NPB) is often referenced throughout strategic policy and plan making outcomes, to capture broad-scale benefits. The report suggests that to achieve NPB, the benefits to the wider public, when applied holistically, would generally outweigh potential significant impacts on a minority (IPCC, 2023). NPB is a term that essentially justifies national and state level decision making. Directives and guidance, when presented at a national scale, can assist with overcoming some of the individual biases that would otherwise hinder the progress of large-scale or contentious proposals otherwise assessed to have significant net public benefits (IPCC, 2023).

National directives and guidance emanate significant power, and this was challenged by Ottinger (2010) who criticised the standardisation of planning practices that "categorically rule out the involvement of citizens in knowledge making and policy making" (p. 265). Localised variations, and the unique dynamics of a place and community should be recognised as influential in coastal adaptation planning, affecting public perception and consensus, implementation and action. Hence, the facilitation of local participation is a necessary component in the realisation of planning outcomes aligned with broad-reaching initiatives, including coastal adaptation (Elling, 2017; Metzger, Allmendinger, & Kornberger, 2021).

2.3.3 Knowledge and Subjectivities of Risk Assessment

A large majority of the literature examined for this thesis described the evolution of natural hazard risk management practices, pivoting on the ways in which risk is perceived, and the purpose for which risks are managed (see: Lupton (1999), Alexander (2013), Australian Institute of Disaster Reslience (2022)). There has been a greater acknowledgment of the influence that 'cognitive psychological factors' have in shaping a person's perception and response to risk (Concha-Homes & Oliver-Smith, 2019). Whereas earlier approaches to risk assessment often dismissed community input as unscientific and uninformed, without consideration of the influence that personal subjectivities and circumstance may have on one's response (Lupton, 1999).

While traditional measures of risk assessment can provide a benchmark for identifying and quantifying change, contemporary approaches stressed the inclusion of community perspectives and local knowledge (Conacher, 2000; Cooper & Pile, 2014). Persistent biases, varying knowledgebases, experience and familiarity are all subjectivities that can influence decision making when determining risk. How these are identified and addressed is fundamental to the ways in which risk is assessed and managed through coastal adaptation planning. People perceive landscape change, and the implications of risk, through a matrix of subjectively interpreted knowledge and meaning.

Decisions and actions that respond to risk are reflective of a multitude of value positions and ways of knowing (Concha-Homes & Oliver-Smith, 2019). With regard to engagement relative to coastal management, the literature described a hesitancy to commit amongst participants, with uncertainties about the future and effectiveness of proposals noted as key concerns (Becker, Payne, & Paton, 2020; Uekusa & Matthewman, 2017; Swaffield & Foster, 2000). For example, Wisner, Gaillard and Kelman (2011) stated that "uncertainty and contingency [are] rife in the study of disaster at all scales, and within all disciplinary perspectives" (p. 19).

Scheller (2020) also suggested that uncertainty can lead to inaction, borne from a fear of doing the wrong thing, or from a desire to retain the status quo. Comfort is sought through societal and cultural norms of practice and tradition, and changing those norms, could significantly impact an individual or communities' sense of identity and connection (Scheller, 2020). The way a community interprets and accepts future risk scenarios, despite notions of uncertainty, must be addressed in coastal adaptation planning practices.

Anderson (2010) explained that anticipatory action is enabled through our individual and collective need to preempt, prevent and prepare for events within the context of uncertainty and risk. A community's acceptance of anticipatory strategies, such as DAPP for coastal adaptation, can be strengthened by increasing their knowledge and understanding of the process and potential risks associated with future scenarios and the long-term consequences of options (Abeysinghe, et al., 2014). Hypothetical scenarios, imagined in relation to a set of events, can be anticipated and acted upon in advance (Anderson, 2010). For example, a scenario of land loss, through erosion, becomes the cause and justification for action in the present. Every action reflects an assumption made based on futures thinking and the knowledge of potential scenarios (Anderson, 2010). The challenge for planners and policy makers is the facilitation of

meaningful engagement to understand differing knowledge systems and subjectivities and then transferring that information into meaningful action.

2.3.4 Social Vulnerability in Coastal Adaptation Planning

Indirect vulnerabilities and structural complexities can compound the overall risk of impact from coastal hazard events and climate change on communities (Begum, et al., 2022). The IPCC Synthesis Report (2023) recorded observations from the impact on communities from climate change induced natural hazards and noted "vulnerable communities who have historically contributed the least to current climate change are disproportionately affected" (p. 21). People have a diversity of complex needs that are not necessarily accommodated for in society. The scale and impact of coastal hazard events will vary from locale to locale, and given that each location has its own intricacies, uniqueness and vulnerabilities, the related losses from an adverse event are unequally distributed (refer section 2.2.4). In terms of risk-based assessment, this means the degree of vulnerability within a community is variable.

In the contemporary practice of disaster management, Wisner, Gaillard and Kelman (2011) defined social vulnerability as "the degree to which one's social status (e.g. culturally and socially constructed) influences the differential impact [of] natural hazards and the social processes which led there and maintain that status" (p. 22). Thomas, Phillips, Lovekamp, and Fothergill, (2013) presented a more disparaging account of social vulnerability, being the result of "the failure of society to recognize that a condition, such as poverty, means you cannot necessarily mitigate risk, live in a safer location, or afford to evacuate when told to do so" (p. 12). The scale of external complexities that influence social vulnerability reinforces the notion of the state as an appropriate mechanism to enable adaptive planning (refer section 2.3.2).

In a coastal adaptation setting, social vulnerability is used as an indicator of the social processes that influence and contribute to one's ability to mitigate, respond and recover from adversity. It is a means of measuring a culmination of factors that could otherwise result in the marginalisation of communities, and inequities amongst groups with less capability and resourcing to respond or recover from adversity (Thomas, Phillips, Lovekamp, & Fothergill, 2013; Concha-Homes & Oliver-Smith, 2019). Used as an index to prioritise actions in coastal adaptation planning, how social vulnerability is addressed in risk-based assessment is significant.

Addressing Social Vulnerabilities in Risk-Based Assessment

Vulnerability to coastal hazards is underscored by inequalities within social systems and structural processes that broadly function around political power relations (Thomas, Phillips, Lovekamp, & Fothergill, 2013). Identifying social vulnerabilities within a community, alongside the structural and political context in it operates, can influence the ways we plan for, build resilience, and respond to risk in coastal adaptation planning (Melnick, 2009; Wisner, Gaillard, & Kelman, 2011). Observations from early literature on disaster management practices showed that risk assessments of 'significant vulnerability' were often attributed to areas with a concentration of built form and population. Traditional assessments of risk were reliant on physical indicators to estimate impacts on property and life (Rulleau & Rey-Valette, 2017). While this allowed for the narrowing down of targeted action in areas of extreme impact, there was little effort afforded to the effect of social vulnerabilities.

With regards to risk assessment, the more an individual considers that their needs and expectations have been acknowledged, rather than the specific interests of those in positions of power, the less likely they are to be skeptical of outcomes (refer section 2.3.2) (Scheller, 2020). Becker, Payne, and Paton, (2020) also noted that the more that a person believes their actions will contribute to a reduction of harm, the more likely they are to participate. Communities that are involved in planning processes are more likely to feel empowered to contribute towards strategies that target community driven, future ideals (Ottinger, 2010). Misiune, Deoekkegrin and Egarter Vigi (2022) suggested that "cohesion in addressing societal challenges, such as climate change … will be essential to mobilize support for scientific activities and to secure the commitment of stakeholders, policymakers and the wider community" (p. 8). Engagement and knowledge production at a local level can enhance decision making and reduce social vulnerability through robust and meaningful outcomes that are responsive to the social context of a place.

It is a necessary component of coastal adaptation planning to account for and manage existing social vulnerabilities that may contribute to, or compound harm. The review of disaster management practices observed increasing recognition of the social and politically constructed context in which risk modelling is placed. Records of investigations from the aftermath of disasters, including Hurricane Katrina (2005) in the US and Cyclone Gabrielle (2023) in NZ, were reviewed for this research. The investigations showed that when determining risk exposure, those assessing natural hazard risks needed to acknowledge and consider not only the physical attributes of a community, but also the context in which a community and it's people

have the resources and capacity to respond to risks themselves (Select Bipartisan Committee, U.S House of Representatives, 2006; Kadetz, Mock, & Zakour, 2018; NIWA, 2024; Harrington, et al., 2023).

The assessment of risk must also consider the effect that social vulnerability and resilience has on a community's exposure to risk, together with the social and political context in which a society functions. Weinkle & Pielke (2017) advocated for risk assessment that is "more than expressions of technocratic faith" (p. 567). Coastal adaptation planning must also address existing vulnerabilities that may contribute to, or compound harm. This requires a deeper understanding of the intersection of social vulnerabilities with environmental risks, including how societal values and processes are reflected in communities.

Societal values and processes are embodied in our landscapes and the impact of coastal hazards, whether incremental or extreme events, are compounded by social vulnerabilities (Cassatella & Peano, 2011). Understanding social vulnerability, while accommodating a diversity of values and perceptions helps direct coastal adaptation solutions that are better aligned to a community's needs. Understanding the social processes that lead to vulnerabilities is recognised as an important concept in coastal adaptation planning (Wisner, Gaillard, & Kelman, 2011). Risk-based assessment is a practice that seeks to address both the individual and cumulative impacts of coastal hazards. To enable a holistic and equitable assessment of risk, planners must address social vulnerabilities and accommodate varying subjectivities and perceptions of risk and value.

2.4 Value-Based Risk Assessment

Risk-based assessment is a necessary component of land use planning and management of risk on coastal communities (Becker, Payne, & Paton, 2020). Contemporary land use practices are increasingly becoming more proactive in seeking to avoid or mitigate risk, particularly in relation to coastal adaptation planning (Abeysinghe, et al., 2014; Concha-Homes & Oliver-Smith, 2019). Proactive and equitable planning requires a deep understanding of the extent to which communities are both vulnerable to coastal hazard risks, and their capacities to build resilience. Within every landscape, and every community, there will be multiple intersecting drivers of vulnerability and change that have unique and differential impacts on risk tolerance (Scheller, 2020).

A key challenge for practitioners of risk-based planning is the ability to delineate and interpret different levels of risk tolerance. Some consequences may be considered acceptable or tolerable

compared to others perceived as high-value losses (Anderson, 2010). There is a level of subjectivity and individual choice in the acceptance of risk which adds to the complexity of the task, and again, the significance of community and stakeholder engagement, incorporating local knowledges alongside technical expertise in risk identification, assessment and decision-making processes is highlighted (Kilvington & Saunders, 2019).

In addition to risk-based assessment, the impacts of climate change on coastal communities can be evaluated using a value-based approach. This refers to the assessment of landscape values to inform coastal adaptation planning (refer also to section 2.2.5). Rubooga (2024) supports the use of landscape values in coastal adaptation planning and emphasised "the significance of incorporating values into coastal adaptation initiatives to facilitate informed decision-making and effective adaptation responses" (p. 11). Her research provided insights into the differing conceptualizations of value in coastal adaptation planning and observations of the relationship of value, with the notion of public acceptability (refer section 2.3.3).

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) report on value-based assessment suggested a diversified valuation typology that "encompasses the richness of people's relationships with nature" (p. 11) can assist to address the multitude of complex societal and environmental challenges. This report also showed that, despite the availability of a multitude of valuation approaches amongst academic disciplines, including visual, historic, archeological and cultural impact assessments, contemporary examples of value assessment continue to prioritise a narrow or refined set of values. The IPBES (2022) noted that "the use of a restricted set of values of nature that underpins many development and environmental policies, is embedded in and promoted by societal norms and formal rules" (p. 11).

The literature from theorists and academics whose disciplines align with the social implications of landscape management showed that the perceptions of our environment, and the values we assign, are strongly influenced by cultural and aesthetic traditions and an individual sense of connection and identity. This theory is culminated in the work of McHarg and Steiner's (2006) book, *The Essential Ian McHarg: Writings on Design and Nature*. McHarg and Steiner (2006) encouraged practices of landscape assessment which "encompasses physical, biological, and cultural evolution; which contains an intrinsic value system; which includes criteria of creativity and destruction and, not least, principles by which we can measure adaptations and their form" (p. 53). The complexities highlighted in landscape evaluation also apply to value-based risk

assessment in coastal adaptation planning. The underlying decisions that are required in coastal adaptation planning are centered around what is considered important and deserving of protection and management. Coastal adaptation outcomes are reflective of the underlying power relations and valuation methodologies used to inform assessments for coastal adaptation planning (Borrie & Armatas, 2022).

2.4.1 Identifying Values of Nature to Inform Coastal Adaptation Planning

Coastal adaptation planning presents an opportunity for planners to seek more meaningful interventions, pre-determined by the context of their communities. Successful adaptation planning reflects equitable governance, with outcomes that have been legitimised through support of the communities impacted (Herbeck & Siriwardane-de Zoysa, 2022). Understanding the diverse nature in which people value their environment requires pluralistic methodologies including the different ways of 'knowing' which can influence decision-making (see section 2.3.3).

Like tolerances of risk, the conceptualisation of 'value' (as defined in section 2.2.5), and what is to be valued can differ greatly and be divisive across individuals, groups, and sectors. Brown (1984) noted:

> Value is neither a concept held by the subject, nor something attributed to the object… it emerges from the interaction between a subject and an object. … value in the relational realm is not observable; it is only at the feeling level. (p. 233)

The genuine assessment of a broad typology of values is necessitated to enable a deeper understanding of the "values and priorities of local communities when planning and implementing strategies to cope with coastal changes and challenges" (Rubooga, 2024, p. 21) However, attempts to define and quantify the value of nature and place is complicated by interpretive and subjective qualifications, and the hierarchies assigned to values.

There is an underlying commonality amongst landscape theorists that 'value' aligns with an individual's actions to manipulate their environment, undertaken when seeking desired or preferred outcomes (Fritzche & Oz, 2007). This reflects the early literature of Brown (1984) who stated "a value is an enduring conception of the preferable, which influences choice and action" (p. 232).

By improving the ways in which values are assessed and interpreted in coastal adaptation planning, biased and maladaptive outcomes can be avoided. And through inclusionary planning

practices, as explored in section 2.3, risk-based assessments shift from "merely characterizing vulnerability and developing interventions or policy responses, to understanding how diverse values shape adaptation processes" (Rubooga, 2024, p. 21). Competing values can also be addressed proactively, reducing opportunities for contention, fundamentally contributing to more effective processes and locally appropriate coastal adaptation outcomes that are responsive to climate change.

The concepts of value explored in the following subsections are examples of 'specific values of nature', as identified in the framework of values typologies developed by the IPBES (2022) (see section 2.2.5). These include experiential and social values, resource and ecological values, natural values and heritage and cultural values. These four value typologies were selected for application in the Concentric Framework for Coastal Adaptation Planning (Figure 4) because they all intersect and fall under the broader nodes of relational, intangible and intrinsic values of nature.

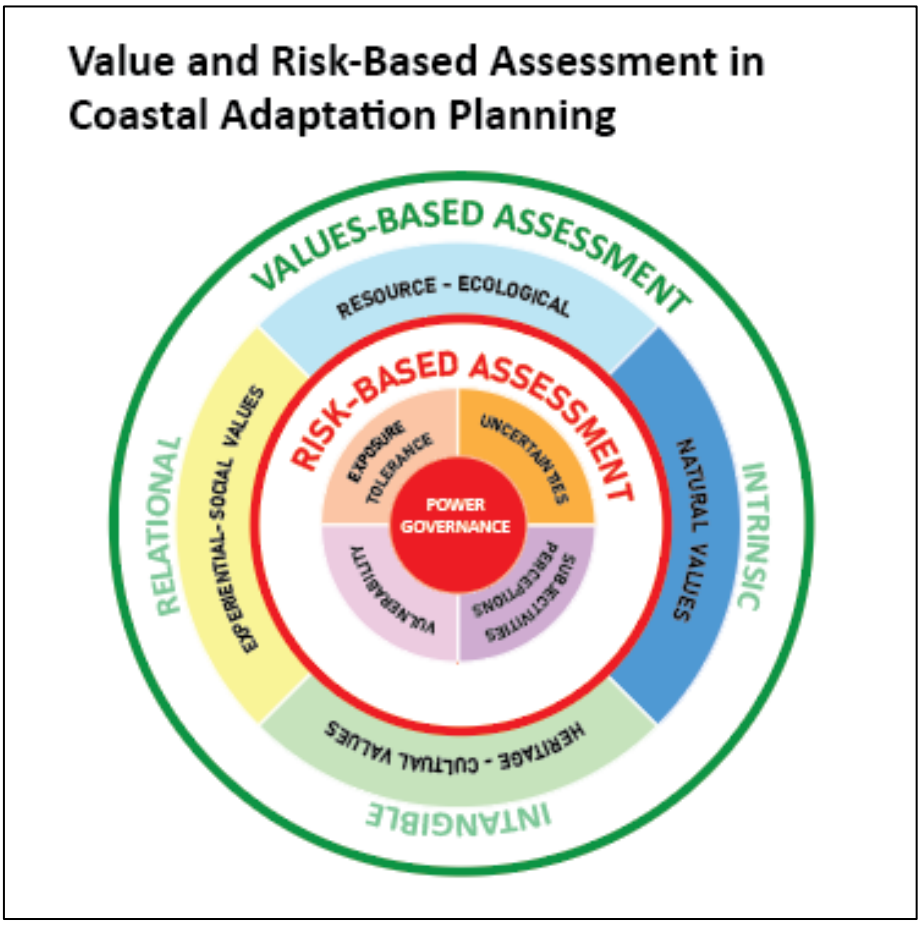

Figure 4: Values-based risk assessment in coastal adaptation planning (Source: Author's own)

Experiential and social values are relational. They are shared values amongst individuals, defined as preferences, principles and virtues, including behavior such as custodian and stewardship (Borrie & Armatas, 2022). Relational values can create cohesion within a community. Resource, ecological and natural values are not only physical but intrinsic attributes of the environment which are valuable and important in, and of, itself. Resource and ecological values include water and biodiversity, which are necessitated to sustain life. Other values that are intrinsic by nature are more than the physical attributes of a place, such as natural character. Heritage and cultural values are also included in the Concentric Framework for Coastal Adaptation Planning, these can be both relational and intrinsic and are sometimes intangible, shared through oral narratives, traditions and customs. These values can only be elicited and truly understood through engagement with the community

Community Engagement to Elicit Specific Values of Nature

Inclusionary planning practices enable a wide breadth of perspective and knowledgebases to be addressed across processes. As explored in section 2.2.5, intangible or intrinsic natural landscape values are generally revealed through genuine public engagement with affected communities (Borrie & Armatas, 2022). To elicit perceptions of risk and value requires thoughtful framing of future climate change scenarios and clear communication of adaptation objectives. As Rubooga (2024) explained, "values must be brought to the forefront [of coastal adaptation planning] and made explicit. This involves finding ways to engage and activate values, whether they are inherently held, implicitly understood, or explicitly recognized by individuals" (p. 23).

The practice of landscape assessment originates from a diversity of disciplines and knowledge systems (Antrop, 2018). A comprehensive body of literature was observed that identified attributes of 'place-character' and 'natural-character' in landscape assessment (Swaffield & Foster, 2000; Chiesura, 2003; Green, 2010; Boffa Miskell, 2019). The case studies reviewed on coastal communities affected by natural hazard events, whether incrementally, or acutely, often referred to attributes of 'character' as being affected. For example, Green (2010) observed that "environmental changes … threaten the very qualities that initially made these places unique and attractive" (p. 1). While intangible and intrinsic landscape features attribute to the character of a place, they may also be associated with an individual or communities' identity, history or culture (Green, 2010).

As described in section 2.2.5, the IPBES (2022) Values Assessment Series framework was developed for the broad purpose of identifying 'values of nature'. A values framework presents such as this could be applied in a coastal adaptation setting. The IPBES (2022) Values Assessment Series framework stated:

> Given the diversity of worldviews, cultures, knowledge systems and disciplines, it is challenging to define nature's values in a universally practical and acceptable way. A comprehensive typology of the diverse values of nature can help guide decisions that affect nature and its contributions to people in diverse contexts (p. 11).

The authors stated the typology of values "can be used by decision makers to consider multiple understandings and policy implications of the diverse values of nature" (Pascual, et al., 2022, p. 18). The IPBES (2022) explored "how people across many different regions and social contexts have conceptualised human-nature relationships" (p. 2) , emphasising relationships between certain values, including:

- the significance of world views, beliefs and knowledge systems.
- the role of normative societal conventions,
- the effect of associated intrinsic, relational, experiential and instrumental values, and
- the weight of quantifiable landscape indicators i.e. ecological attributes.

Intrinsic and intangible values associated with a place, while diverse in attribute, often have similarities in that the values of those attributes, are often derived from the features and characteristics of a landscape (Pascual, et al., 2022). Using a framework to guide value-based approaches to risk assessment in coastal adaptation planning would ensure that outcomes are "deeply rooted in the specific cultural, environmental, and historical context of a place" (Rubooga, 2024, p. 21). Intrinsic and intangible values intersect and are influenced by the ways in which people relate to and experience them. Pascual, et al., (2022) generalized this through the interrelationship of how we subconsciously 'live-from', 'live-in', 'live-with' and 'live-as' nature.

Integrating Cultural, Intangible, Intrinsic and Relational Values

Landscapes are a legacy of the past, they provide a sense of place and can signify a way forward and a possible future (Anderson, 2010). Social, heritage and cultural values are deeply connected to the environment, and the values attributed to a landscape can influence the ways

in which oneself' considers their identity and sense of connection to society (Hanara & Jackson, 2019; Mannakkara, Elkhidir, & Matiu, 2023). Bicultural foundations underpin the institutional context of NZ planning (Chapter 3), and with this, there are both synergies and autonomies between non-indigenous heritage and cultural associations and Mātauranga Māori, the indigenous knowledge system of NZ (Dioniso, Walker, Macfarlane, Yates, & Matunga, 2024). These include differing perceptions of risk and associations of landscape value.

Intangible or intrinsic natural values attributed to landscapes are relational by nature. As with other specific values of nature, including heritage and cultural values, relational values cannot be understood in isolation (Green, 2010). For example, together with the customs and traditions that have occurred, cultural landscapes may be represented by a physical place or feature, or they can be expressed through oral stories and artistic representations (Pettenati, 2023).

Inclusionary planning practices should be used to empower the community to express their own interpretations of cultural values and intrinsic, intangible and relational values such as natural character and social-experiential attributes (Pascual, et al., 2022). Only after these deeply rooted values have been effectively communicated by those affected, can they be used to genuinely inform coastal adaptation planning (Mannakkara, Elkhidir, & Matiu, 2023).

Highlighting the significance of integrating cultural, intangible, intrinsic and relational values, Pettenati (2023) described how heritage and cultural landscapes are perceived as "landscapes of power" (p. 133), observing the influence of such values in landscape preservation objectives and outcomes. For example, Pettenati (2023) outlined a process in which landscapes reflecting specific 'narratives' of the past, present and future become official 'interpretive gateways', developed to guide landscape preservation objectives. He explained that "the application of interpretive gateways requires a 'vocabulary' of landscape elements and a 'syntax' for putting them together so they make sense" (Pettenati, 2023, p. 173).

Interpretive gateways should be built into coastal adaptation planning decision making processes early, because it enables cultural values, as well as intrinsic, intangible and relational values, to be embedded more deeply into adaptation solutions. In any given community, transparency of the evaluation methodologies used in coastal adaptation planning is necessitated. The following section explores the assessment of specific values of nature, and how they can be used to inform coastal adaptation planning.

2.4.2 Approaches to Value-Based Assessment

Value-based assessments are useful to inform and assist decision-makers to prioritise actions for coastal adaptation planning. They are necessitated to be able to decipher and genuinely understand the multiple associations and relations of value, attributed to landscapes. The objective of coastal adaptation planning is to build resilience locally, alongside the provision of a range of environmental and societal benefits (refer section 2.2). However, there are dynamic intersections of perception, uncertainty and subjectivities of risk and value to be understood, before net public benefits from coastal adaptation can be truly realised (Misiune, Deoekkegrin, & Egarter Vigi, 2022).

Because of the diverse ways that individuals and sectors of the community value nature, there are varying conceptualisations of what is valued and of value (Borrie & Armatas, 2022). Equally, there are a diversity of approaches to the evaluation of landscapes amongst practitioners of landscape assessment. Examples of qualitative approaches include landscape visual impact and natural character assessments, while ecological or archeological assessments generally rely on scientific, quantitative techniques. Despite this wide range of methodologies available to evaluate landscapes, there are limited narratives on the significance of differential, pluralistic and intangible values in landscape assessment (Pascual, et al., 2022). Green (2010) made an early observation of the lack of exploration into the effects of coastal hazards on the value of landscapes, particularly how people conceptualise, experience and value a place following a significant change.

Both costs and benefits of coastal adaptation solutions can be unequally distributed amongst groups of society, compounding the likelihood of tension and vulnerabilities in the facilitation and implementation of coastal adaptation planning (Wisner, Blaikie, Cannon, & Davis, 2004; Thomas, Phillips, Lovekamp, & Fothergill, 2013). Planning interventions may inadvertently result in effects that are unequally distributional, benefiting some values over others (Adger, Hughes, Folke, Carpenter, & Rockstrom, 2005). When the distribution of benefits in relation to landscape values is not appropriately considered and addressed in coastal adaptation planning, the solutions presented can present as unjust or unequal towards some (Concha-Homes & Oliver-Smith, 2019).

Building on the previous section (2.4.1), there is a significant challenge in the assessment of landscape values that are intrinsic, intangible and relational by nature, including cultural associations (Rubooga, 2024). It is a seemingly impossible task for planners to reconcile all the

values that could be used to inform coastal adaptation planning from what can be described as a complex and dynamic assemblage of subjectivity and perception. Further complicating this task in practice, coastal adaptation planners are often constrained by the extent to which current policy and plan making tools accommodate such values (Conacher, 2000; Pettenati, 2023). Often, planners must work within a structure that is rigid, with inherent biases and power relations (Elling, 2017; Kadetz, Mock, & Zakour, 2018). In coastal adaptation planning, planners seek to facilitate balanced and sustainable outcomes, while avoiding contention and cynicism. To enable this requires a deep understanding of the significant influence of landscape values, alongside proactive, inclusionary and transparent practices through all stages of adaptation planning (Rubooga, 2024).

Every landscape and community will have its own individual suite of drivers that influence landscape change, including resilience and vulnerabilities (refer section 2.3.4). The consequences of coastal hazards, in the form of landscape change, are variable and unique (Melnick, 2009; Scheller, 2020). The identification of tolerances to risk and the influence of values of nature can assist to plan for coastal adaptation. However, uncertainty remains a common denominator in the face of climate change. Reflecting what Scheller (2020) stated, "how we react to change will be as important as change itself" (p. 31); to manage differing perceptions of landscape change, the people most close to an area must be empowered to influence and facilitate action towards coastal adaptation.

2.4.3 Applying Value-Based Risk Assessment in Coastal Adaptation Planning

The prospect of significant and irreversible change upon the things we value, influences how risk thresholds are determined in coastal adaptation planning (section 2.3.3). For example, impacts on the historic and cultural attributes of an area can also contribute to the significant erosion of ones' sense of place or self-identity, with ongoing effects on many other aspects of a person or communities overall wellbeing (Sesana, Gagnon, Ciantelli, Cassar, & Hughes, 2021; Mannakkara, Elkhidir, & Matiu, 2023). Understanding the significance of coastal hazard impacts on specific values of nature is useful, because those impacts can present as a 'tipping point' that triggers and enables action towards coastal adaptation. Tipping points are also referred to as risk thresholds and are applied in dynamic adaptive pathways planning (refer to section 2.2.1).

Risk thresholds signify a point within a devastatingly imaginable, but uncertain, future (Beck, 2006). Identified tipping points can prompt the implementation of options that were once dismissed as inappropriate by a community, or difficult to implement. In coastal adaptation planning, contentious and polarising options, including managed retreat and relocation (section 2.2.2), become more acceptable once considered against the likelihood and scale of adversity. Rulleau and Rey-Valette (2017) explained, an individuals "preferences [for coastal adaptation] rely on a rational reasoning that integrates the need for change … and a degree of consciousness about the limits of the current approaches" (p. 17).

How communities and individuals respond to coastal hazards risks is dependent on their perceptions of risk and subjectivities of reason and value (Rubooga, 2024). B Anderson (2010) considers the importance of anticipatory action in planning. The timing and ways in which people act towards risk are fundamental to the concept of anticipatory action (refer to section 2.3.3). Anticipatory action is necessitated in coastal adaptation planning because adaptation responses are generally precipitated by either an awareness and appreciation, or through direct exposure to environmental change (Cooper & Pile, 2014). In coastal adaptation planning, anticipatory action is enabled through a need to prepare for and prevent threats to the coastal environments that society values.

The degree to which a community are willing and capable of adapting can only be realised from a local level (Tierney, 2014; Pascual, et al., 2022). Through genuine public engagement, facilitated through inclusionary planning practices, planners and policy makers are guided by the community themselves as to the specific values of nature, worthy of protection in coastal adaptation planning. Information on landscape values gained through these processes (section 2.2.6) can then be used in dynamic adaptive pathways planning to identify risk thresholds or tipping points which trigger actions towards coastal adaptation.

It is a difficult task for planners to propose futures that retain high levels of uncertainty, such as the magnitude of sea level rise and frequency or scale of erosion (Anderson, 2010). However, the identification and assessment of landscape values assists by providing planners with a basis for identifying and qualifying change within a community (Cassatella & Peano, 2011). The practice of sharing information and knowledge also contributes towards greater reasoning and acceptance of solutions from the community (Elling, 2017). By including the community in the identification of landscape values, and in the determination of risk thresholds, they are more

likely to accept coastal adaptation planning proposals, having already been through a process of reasoning and legitimisation (Rubooga, 2024).

Social movements of the 20th Century resulted in an increase in local advocacy and community-based planning practices (Vigl, Deppellegrin, & Misiune, 2022) (see also section 2.3.1). This has resulted in more emphasis on diversity, pluralism and multiculturalism in planning theory, realised through value-based concepts of social justice, participation and legitimacy (Taylor, 1999; Swapan & Khan, 2013). It is a period that witnessed a shift from the "view of the town planner as an expert, to the planner as a manager and facilitator" of change (Taylor, 1999, p. 341). Through this evolution of planning practices, the value of public participation and significance of pastoral power has been realised (refer also to section 2.3.2).

Through inclusionary and pastoral planning practices, communities can be empowered to contribute and fundamentally shape, coastal adaptation planning outcomes (Concha-Homes & Oliver-Smith, 2019). Participatory and inclusive practices are key to the gathering, deciphering and conveyance of knowledge and information on both risk and landscape values. These are also useful techniques, when practicing in a field of conflict and tension (Elling, 2017), as often arises in matters of such complexity as climate change (Chapter 1). The following section explores the management of conflicting or polarising values in the facilitation of value-based risk assessment, to inform coastal adaptation planning.

Conflicting and Polarising Perceptions of Risk and Landscape Value

Coastal adaptation planning often necessitates a tradeoff between multiple conflicting values and priorities in risk assessment. Cooper and Pile (2014) noted that "adaptation is not a straightforward concept and can be the basis of considerable conflict" (p. 91). This is because, often, higher-order directives are also politically polarising, and government objectives do not necessarily align with local expectations, arousing public discontent (Ericksen, Berke, Crawford, & Dixon, 2003).

Coastal adaptation planning takes place within a field of conflict and tension (Narayan, et al., 2020). People and communities are socially related, dynamic, and complex; they have differing values, perspectives on risk and beliefs that can change as knowledge is accumulated and understandings are reached (Wetherell, 2012). "Given the diversity of worldviews, cultures, knowledge systems and disciplines, it is challenging to define nature's values in a universally practical and acceptable way" (Pascual, et al., 2022, p. 11). Building on the complexity of tasks required of coastal adaptation planners, Narayan, et al. (2020) observed that "even when

responding to the same hazard, adaptation responses can vary significantly depending on local priorities and capacities; and they need to be embedded in the local adaptation context…" (p. 199).

Despite strong arguments for diversity and inclusionary practices in landscape assessment, observations of case studies made, by the IPBES (2022), highlighted enduring structural biases, undertaken deliberately by sectors seeking aligned outcomes. Some professions, institutions and commercial sectors are strongly aligned to traditional and quantitative approaches to landscape assessment (section 2.3.1). Examples included those whose primary function is ecological conservation, or, at the other extreme, civil engineering and construction (Swaffield & Foster, 2000). Professions that have a strong function or purpose may express concern over the coupling of values within societal structures and systems (Pascual, et al., 2022). Swaffield and Foster (2000) used ecological objectives as an example; they do not always align with societal values or economic outcomes. In this example, a conservationist may treat aesthetic and social qualities as separable ancillary components, while social attributes considered inconsequential to desired ecological goals. As a result of these biases, values deemed to be of less importance are not captured in objectives or outcomes (Pascual, et al., 2022).

The Significance of Genuine Public Engagement in Coastal Adaptation Planning

Public participation is a 'mode of legitimization', suitable in complex and dynamic situations including coastal adaptation planning. Genuine public engagement and participation is a tool to be acknowledged for its invaluable potential to decipher and diffuse conflict before a point of cynicism is reached within a community. Dialogue, when used effectively through participation is a useful mechanism for planners and decision makers. It has the potential to assist with the diffusion of conflict and tensions within any given situation (Friedmann, 2008; Elling, 2017). Yet Metzger, Allmendinger, & Kornberger (2021) observed that too often in planning practice, genuine local level public engagement is described as troublesome and difficult to achieve, without considerable delay.

From a project management perspective, public participation can be presented as an obstacle, proving extensive, timely and complex. Difficulties can arise in the bridging of conflicting values, polarising perceptions and differing expectations of the political, the wider public and local communities (Metzger, Allmendinger, & Kornberger, 2021). Despite its complexities, Metzger, Allmendinger and Kornberger (2021) suggest public engagement should be viewed not as "a resource that planners work with to help them achieve their practical, pragmatic goals"

(p. 317). Inclusionary, participatory planning practices can reduce the likelihood of resistance during strategic implementation stages. As Elling (2017) asserted, "the potential reforming of power relations through public participation can actually facilitate decisive planning initiatives (p. 236).

Engagement is particularly important when managing proposals that have a direct impact at a local, societal scale. When a community is adversarial impacted by a proposal, they can present as dejected and express a sense of inequity and injustice (Elling, 2017). This is more probable if a wide breadth of values of importance to a community have not been transparently considered during the early phases of coastal adaptation planning (Rubooga, 2024). Public participation in planning processes is recognised as an effective form of 'governing statement' for which value-based policies can be afforded legitimisation (Huxley, 2013).

For planning outcomes to be achievable and effective, they must have a connection with the knowledge and insights of the local communities affected (Elling, 2017). Fischer (2000) explored how the gaining of public input, and the provision of social learnings through participation, can assist to resolve complex social, economic and environmental problems. He highlighted the role of the public in the realisation of planning initiatives and called for 'meaningful' and 'locally contextualised' knowledge input into policy making. Engaging with the public at the grass-roots level is a necessity for planners to achieve successful outcomes (Friedmann, 2008; Swapan & Khan, 2013). In coastal adaptation planning, this can help to direct adaptation objectives that are appropriately aligned with community expectations, with solutions afforded legitimation by those considered most affected. As explored in section 2.3.2, planners can contribute to the fostering of positive social structures and community outcomes by adopting inclusionary planning practices and pastoral processes.

In coastal adaptation planning, these approaches assist to reconcile or balance real world constraints, social vulnerabilities and differences amongst communities. Facilitating dialogue, planners are assisted to identify the typologies of pluralistic values that influence the assignment of risk thresholds in coastal adaptation planning. Public participation is a significant tool in coastal adaptation planning, assisting bridge external relations amongst participants and addressing polarising perceptions of value and risk.

2.5 Summary

It has been established above that managing risk from climate change is essential, particularly in relation to coastal communities in small island communities, including in NZ. This chapter explored literature of relevance to value-based risk assessment for coastal communities, within the broader context of climate change resilience and adaptation planning. Interrelations and challenges were identified in relation to the assessment of risk and the assessment of landscape values in coastal adaptation planning. Scholarly literature was explored to identify how risk and landscape values are expressed and how they are used to inform coastal adaptation planning (Research Objective 1).

Having explored the literature and realised Objective 1, this section concludes with the synthesis of the literature graphically. It presents the Concentric Framework for Coastal Adaptation Planning (Research Objective 2), to be later used for thematic analysis of the case study documents (refer Chapter 4). This framework visually represents key themes and relationships of coastal adaptation planning, drawn from the literature, and provides a structured lens through which to interpret the case study.

Concentric models were used in early descriptions of urban and spatial planning to illustrate how cities grew and developed over time. For example, Burgess and Hoyt, sociologists of the 1920's, applied concentric zoning models to Chicago, applying concentric rings devoted to differing land uses such as the central business district, residential and commuters (Meyer & Esposito, 2014). Another example is Ebenezer Howards 'Garden City' model which "is centrally informed by preoccupations about the spatial combination of different dimensions of social life" (Tizot, 2018, p. 1). Each of these models presented a visualization of what is now described as urban sprawl, or the nexus of urban and rural.

Wisner et al. (2004) provides an example of a layered model, they present the Pressure and Release model which visualizes disaster risks, particularly vulnerability, through a concentric layered structure. In this example, expanding and contracting circles represent decision making and risks through layers that are both nested and independent. A centric model is also provided in guidance of NZ's Ministry for Environment which illustrates a circular process for decision making in coastal adaptation planning. To realize Objective 2, the literature above has been reconfigured graphically below, showing the concentric nature of risk and landscape assessment, in relation to coastal adaptation planning – see Figure 5.

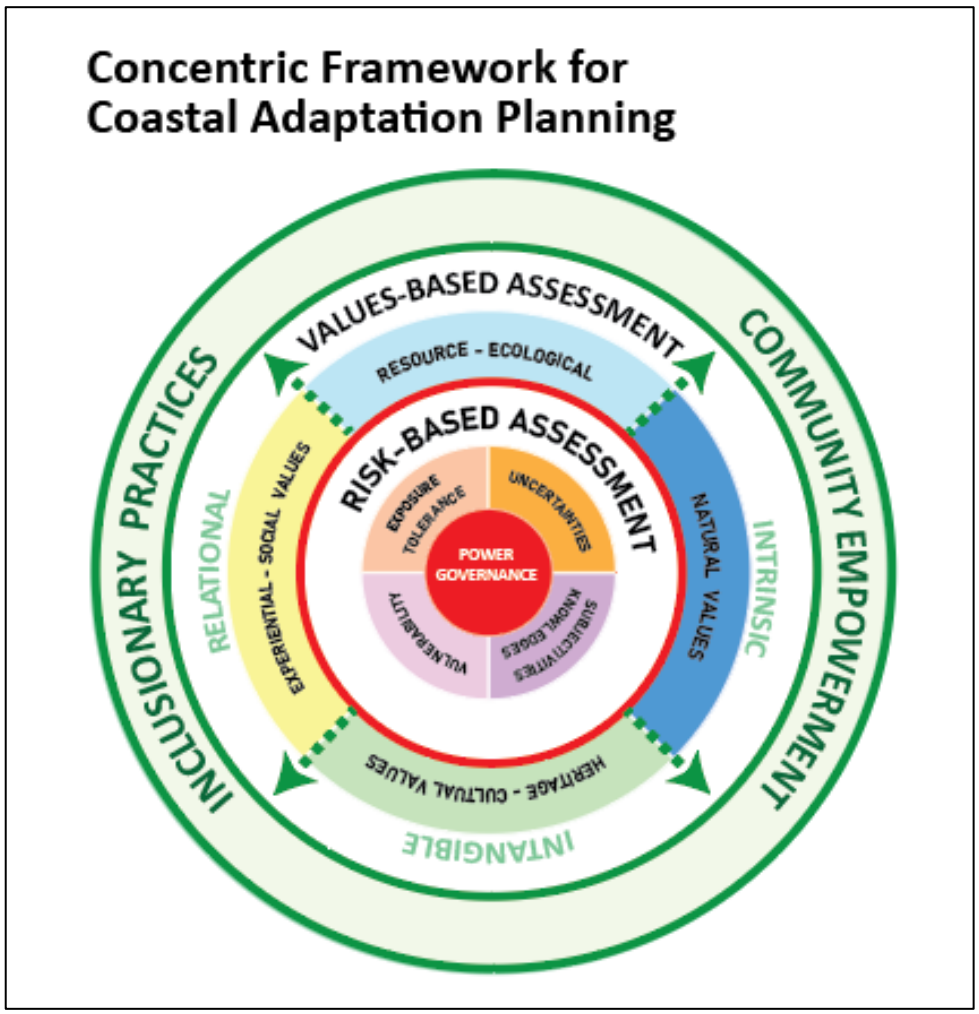

Figure 5: Concentric Framework for Coastal Adaptation Planning (Source: Author's own)

These themes reflect not only how risk is assessed and communicated, but also how values, particularly relational, intangible and intrinsic values, shape the acceptability and success of coastal adaptation planning. This concentric graphic (Figure 5) forms the basis for which themes and codes have been adapted for the qualitative document analysis and used to answer the research question. It also illustrates the hierarchical and diverse, but interrelated nature of risk and value-based assessments in relation to coastal adaptation planning. It shows that underpinning each ring of evaluation, there are a diversity of components, with each level influenced or affected by some form of power or governance.

The concept of power and governance is used as a central code applied to qualitatively analyse the case study documents (refer Chapter 4). A fundamental connection to governance and power in coastal adaptation planning is drawn from the literature (see section 2.3.2). Power and governance is central in the driving of action towards adaptation, both globally and at a

community scale. Decision makers, planners and the community all have a crucial role in driving and facilitating action towards climate adaptation (IPCC, 2023). Governance and power were recognised as being central agents of change towards coastal adaptation planning. This includes the influence of global objectives on risk assessment practices over time and changing political positionings on climate change, alongside community empowerment and (sections 2.3.1 - 2.3.2).

The social context and the structure and power balances can restrict or narrow adaptation responses available to a community. To enable equitable and successful outcomes in coastal adaptation planning, planners must have a good understanding of the political governance and local context in which they are practicing. An exploration of common terms identified there are complexities in the interpretation and defining of risk and landscape value in coastal adaptation planning literature (section 2.2). This review found there are numerous complexities and intricacies of risk assessment. Uncertainty, differing knowledge bases and tolerances of risk were identified as influential factors of risk assessment, alongside intersections with social vulnerabilities (sections 2.3.3 - 2.3.4). Underpinning the intricacies of risk-based assessment, these four concepts informed the next set of thematic codes used in the concentric framework.

Building on the learnings of risk assessment, the significance of addressing specific values of nature in coastal adaptation planning, particularly relational, intangible or intrinsic values, was realised. The dynamics of value-based assessment and its relationship to risk assessment and community legitimisation was also highlighted (section 2.4). The literature reviewed on value-based assessments assisted in the development of a typology of landscape values to be used as thematic codes in a concentric framework, applied in the analysis of the case study documentation. This was intended to assist in building an understanding of how specific values of nature are be used to inform risk assessment in the practice of coastal adaptation planning.

Reinforcing the interrelation of power and governance in coastal adaptation planning, section 2.4.3 builds further on the facilitation of value-based risk assessment. It presents further observations from across the literature on the facilitation and implementation of adaptation planning initiatives, highlighting the risk of conducing maladaptive solutions and the potential for conflict and tension amongst participants. In recognising the central role that power and governance plays in coastal adaptation planning, inclusionary and pastoral planning practices were also identified as significant tools that can be used at the local level to proactively diffuse tensions in practice. The research showed that engagement and community empowerment at a

local level is equally significant and influential in the facilitation and implementation of coastal adaptation.

These underlying concepts, drawn from the literature, were applied as thematic codes to analyse and interpret the documented assessments from the case study. Appendix 1 provides an example of data collected, which shows the alignment of literature and key authors, with the thematic coding applied across the qualitative document analysis, which follows. Further information on the research design and methodology is provided in Chapter 4. In preparation for the qualitative document analysis of the case study, Chapter 3 describes the institutional context in which the selected case study is situated.

Chapter 3

Institutional Context of Coastal Adaptation Planning in Aotearoa

3.1 Introduction

The concept of 'preserving the natural character of the coastal environment' has been an integral and core aspect of NZ planning law since the Town and Country Planning Act in 1973 (Boffa Miskell, 2019). However, the focus in NZ has been on mitigation, with little policy effort or government funding initiatives for adaptation. This may have been due to "the unclear role of local authorities with regard to rules, regulations and strategies for adaptation" (Hennessy, et al., 2007, p. 522). Only recently has NZ begun to implement adaptive capacity, systematically and at a wide scale. This chapter explores the legislative requirements mandating coastal planning functions across different levels of governance, and recent parliamentary discussions which signal the direction of coastal adaptation planning in NZ.

Understanding coastal adaptation planning requires knowledge of the institutional framework in which planners operate. There are multiple institutional frameworks and legislative measures in place that function alongside fluctuating political dynamics. Core features of the institutional structure that shapes coastal adaptation in NZ includes national legislation and directives, regional and local policy and strategic planning documents (Ericksen, Berke, Crawford, & Dixon, 2003).

The management of the coastal environment in NZ is guided by three key statutes: the Resource Management Act 1991 (RMA 1991), the Local Government Act 2002 (LGA 2002) and the Climate Change Response Act 2002 (CCRA 2002). Additionally, the NZ planning legislative framework integrates principles from Te Tiriti o Waitangi (The Treaty of Waitangi), a foundational document of NZ governance, signed in 1840 between the Crown and Māori. The statutory documents under all of these Acts require some form of participatory democratic processes.

Ericksen, Berke, Crawford, and Dixon, (2003) described the RMA 1991 as combining the best of both rational and participatory planning theories. They considered it presents a hierarchy of governance, in which regional and local councils function as agents for central government. The intention of the RMA 1991 was to provide consistency and integration through a centralised framework, enabling intergovernmental cooperation through the devolution and

decentralization of power (Ericksen, Berke, Crawford, & Dixon, 2003; Rouse, et al., 2017). However, this approach was undermined by the slow provision of national guidance documents and a history of discord between local and regional councils (Parliamentary Commissioner for the Environment, 2015). Such problems in its implementation were commented on by Rouse, et al. (2017) who noted, "the varying responsibilities of national, regional and local actors under different legislation lead to gaps and overlaps in the management of coastal environments and the effects of climate change (p. 187).

Concerning coastal adaptation, it has been acknowledged widely in NZ that "it is difficult to implement adaptive planning within the current planning and development regime" (National Science Challenges, 2023, p. 2). Up until 2022, the New Zealand Coastal Policy Statement was the only national direction relevant to the management of the coastal environment. In 2022 the Ministry of the Environment introduced the National Adaptation Plan 2022 (NAP 2022) under the Climate Change Response Act (2002) (see section 3.5). This was followed by political agreement to replace the RMA with two new Acts that have distinct purposes: "one to manage environmental effects arising from activities [Natural and Built Environment Act (NBEA) 2023], and another to enable urban development and infrastructure [Spatial Planning Act (SPA) 2023]" (Bishop & Court, 2024). The introduction of the NAP (2022) was intended to be aligned within these new Acts, and climate adaptation was to become a central matter to be promoted across all levels of governance in NZ. However, these new Acts were repealed in 2023 "as part of the coalition agreements between the National and Act parties" (New Zealand Parliament, 2023).

There are other proposed reforms being rolled out by the current coalition government that are relevant to coastal adaptation planning. These include the Treaty Principles Bill, the Fast-track Approvals Act 2024 and reforms intended to enhance property right protections and address existing deficiencies within the legislative system. Each Act, and other relevant legislation and nationally binding documents are discussed further below, including Te Tiriti o Waitangi (The Treaty of Waitangi), the Marine and Coastal Area (Takutai Moana) Act 2011 and the Local Government Act 2003. NZ's first National Climate Change Risk Assessment (NCCRA, 2020) and subsequent National Adaptation Plan (NAP 2022) are also explored. The Ministry for the Environment (2024) has published a comprehensive framework of legal instruments relevant to coastal adaptation planning (see: Lawrence & Bell (2024)). While there is a broad suite of Acts, this discussion is limited to a select few that are considered pertinent to the objectives of this research.

3.2 Resource Management Act 1991

The Resource Management Act 1991 (RMA) guides local authorities in the sustainable management of natural resources in New Zealand. The purpose of the RMA 1991 is outlined in Section 5. It states:

1. *The purpose of this Act is to promote the sustainable management of natural and physical resources.*
2. *In this Act, sustainable management means managing 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 reasonably 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 of activities on the environment

While this purpose does not specifically address climate change adaptation, its principles and effects-based approach to sustainable management supports integrative and adaptive decision making. Presently, the RMA (1991) requires the consideration of social, economic, and cultural wellbeing, alongside the quality and longevity of our environment and resources (RMA 1991, Part 2). However, as the Government looks to address challenges with the current system, the RMA is undergoing significant reform.

As a matter of national importance, the RMA (1991) requires that all persons exercising functions and powers under it "shall recognise and provide for the preservation of natural character of the coastal environment (including the coastal marine area), wetlands and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use and development" (RMA 1991, s6(a)). Restrictions on the use of the coastal environment are primarily detailed within sections 9, 10 and 12, which establish duties and restrictions on the use of land and the coastal marine area, among others. Section 12 of the Act refers to restrictions on the use of the coastal marine area, including s12(1) which restricts activities that impact the foreshore and seabed. While sections 9 and 10 do not apply to the use of coastal marine areas

(see: s9(6)(e) RMA (1991)), these provisions do regulate activities on land which may be in a coastal environment, but outside of the coastal marine area.

The RMA also specifies the functions and powers of the Minister for the Environment (sections 24, 52 and 58E) and the Minister of Conservation (sections 28 and 57), who hold crucial roles in the management of NZ's coastal environment. Specifically, the Minister of Conservation is mandated through section 28 RMA to prepare and recommend the NZ Coastal Policy Statement and to monitor its effectiveness alongside coastal permits and restricted coastal activities. Together, these sections of the Act stipulate the roles and responsibilities of both Ministers in managing and protecting NZ's coastal environments.

As noted, at the national level the RMA (1991) requires a National Coastal Policy Statement (section 57(1)). The New Zealand Coastal Policy Statement 2010 (NZCPS 2010) provides direction on the management of coastal environments. The first National Coastal Policy Statement was gazette in 1994 (Department of Conservation, 1994) and the current version was gazette in 2010. It was one of the earliest national policy statements adopted under the Resource Management Act 1991. The NZCPS (2010) has a crucial role in coastal adaptation planning, providing direction on the sustainable management of the coastal environment, with an emphasis on long term resilience.

3.2.1 New Zealand Coastal Policy Statement (2010)

The NZCPS (2010) sets out objectives and policies addressing the management of the coastal environment. Objectives 1 and 5 of the NZCPS (2010) are pertinent to coastal adaptation. These seek to protect and sustain the coastal environment, while managing coastal hazard risks to protect people, property and infrastructure. The objectives are supported by 29 policies, of which several provide guidance on coastal adaptation.

Policy 24 of the NZCPS (2010) focuses on the identification of coastal hazard risks and is supported by Policy 25, which addresses activities within identified coastal hazard areas. Policies 26 and 27 promote the use of natural defenses in coastal hazard management and provide strategies to address existing development. Other policies are relevant to the protection of specific attributes of the environment, including natural character (Policies 13 - 15), kaitiakitanga (Policy 2), biodiversity (Policy 11) and the need for public space and access to coastal environments (Policies 18-19).

Regarding coastal adaptation at a regional level, regional authorities hold a crucial role in the direction of coastal adaptation, including the development of regional strategies and policies that address the impacts of climate change on coastal environments. The RMA 1991 sets out the functions of regional authorities (s30). Section 64 requires every regional authority to prepare a regional coastal plan, while sections 66-67 set out the matters to be considered and contents to be included in a regional plan or regional coastal plan. For example, s67(2)(b) requires that a regional plan must give effect to any NZ coastal policy statement.

At the local level territorial authorities hold a fundamental role in the implementation of coastal adaptation planning, under the RMA 1991. Key functions of territorial authorities include the establishment and implementation of objectives, policies and methods to manage the effects of land use, development or protection of land, including for the purpose of "the avoidance or mitigation of natural hazards" (s31(1)(b)(i), RMA 1991).

There are also six unitary authorities in NZ, such as Auckland Council, which carry out the functions of both territorial and regional authorities under s30 and s31 of the RMA. Unitary authority is defined in Section 5 Local Government Act (2002) as "a territorial authority that has the responsibilities, duties and powers of a regional council conferred on it…", while the RMA (1991) defines 'local authorities' as territorial authorities or regional authorities. Local authorities, including territory, regional and unitary authorities, are empowered through the RMA to employ a range of methodologies and strategies to ensure the resilience and sustainability of coastal communities and environments.

3.2.2 Regional Council: Regional Policy Statement and Regional Coastal Plans

The case study location, Kāpiti Coast District, is located within the Greater Wellington Region (see Figure 6). The rational for regional governance in NZ, as referred by Ericksen, Berke, Crawford, and Dixon (2003), is that it is of a sufficient size and scale for addressing larger scale problems and the mitigation of effects, where local jurisdictions would be too small in terms of resourcing and capacity. In 2003 they conducted a review of regional policy statements across NZ and observed wide variability in the allocation of responsibilities relevant to the management of natural hazards.

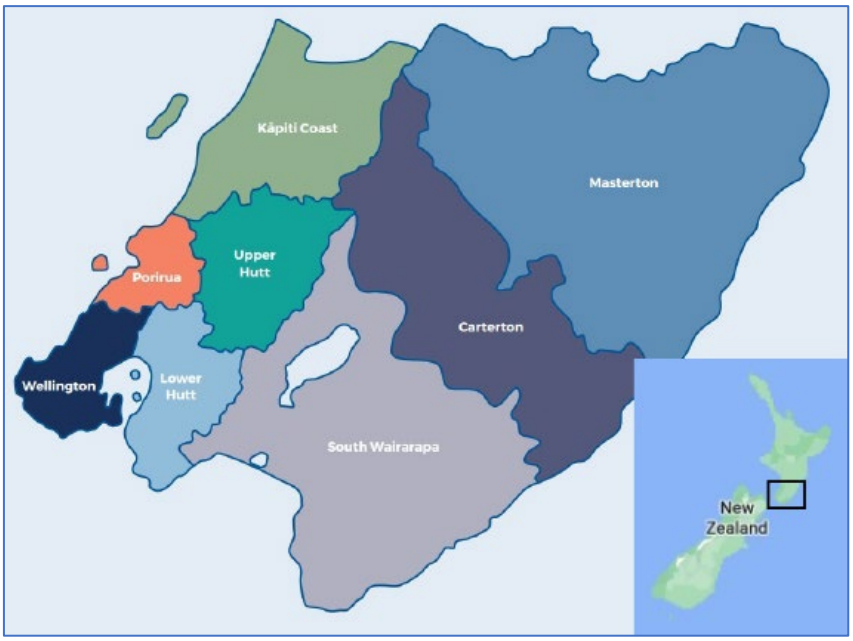

Figure 6: Location of Greater Wellington Region in NZ (Source: Australian Institute of Disaster Resilience, 2022)

Regional Council functions are set out in section 30 of the RMA (1991) and this includes:

> *s.30(1)(c) the control of the use of land for the purpose of -*
>
> *(i) soil conservation:*
>
> *(ii) the maintenance and enhancement of the quality of water in water bodies and coastal water:*
>
> *(iii) the maintenance of the quantity of water in water bodies and coastal water:*
>
> *a. the maintenance and enhancement of ecosystems in water bodies and coastal water:*
>
> *(iv) the avoidance or mitigation of natural hazards*

Part 5, subpart 3 of the RMA (1991) requires Regional Councils to prepare a Regional Policy Statement (RPS), addressing the matters set out in s 61(1) of the Act. For instance, s 61(1)(da) of the RMA (1991) requires the RPS to be in accordance with National Policy Statements and the NZCPS (2010) and is required to be prepared in conjunction with the Minister of Conservation (s 61(2)(a)(i)). Regional policy statements have an influential role in shaping local authority plans and policies addressing coastal adaptation planning.

The Regional Policy Statement for Greater Wellington (RPS-GW) is a second-generation document; adopted in 2013, it is currently going through appeals on a proposed plan change, some of which relate to the management of coastal hazards. For instance, Objective 20 is

strengthened to incorporate broader matters: "Natural hazard and climate change mitigation and adaptation activities minimise the risks from natural hazards and impacts on Te Mana o te Wai, Te Rito o te Harakeke, natural processes, indigenous ecosystems and biodiversity. ~~Hazard mitigation measures, structural works and other activities do not increase the risk and consequences of natural hazard events."~~ (Greater Wellington Regional Council, 2024)

While the RPS-GW already included objectives and policies which directly relate to climate change, hazard risk reduction, and coastal hazard management, the proposed plan changes seek to better align these provisions with national direction, including issues related to coastal hazards, risk and consequence have been appealed. These include the introduction of Policy 51 which required consideration of climate change effects in planning and decision-making processes, while Policy 29 incorporated more stringent controls on development in high-risk coastal areas (Greater Wellington Regional Council, 2024).

Section 64 of the RMA (1991) requires that Regional Councils prepare a Regional Coastal Plan in alignment with the NZ Coastal Policy Statement. For the case study area, Greater Wellington Regional Council's Regional Coastal Plan is integrated into a wider plan, referred to as the Natural Resources Plan. The operative Natural Resources Plan has been through a plan change, becoming fully operative in July 2023 (Greater Wellington Regional Council, 2023). The Natural Resources Plan also includes rules and methods that support coastal adaptation planning. These include coastal hazard mapping alongside development restrictions in hazard-prone areas, objectives and policies on natural hazard risk management, and incentives for relocation or retreat in high-risk zones (Greater Wellington Regional Council, 2023). For example, Objective 045 of the Natural Resource Plan (2023) requires that "Use and development shall generally not be located in the coastal marine area unless it has a functional need or operational requirement to be located there." (p. 60).

3.2.3 District Councils: District Plan

Section 73 of the RMA 1991 requires District Councils to prepare a District Plan. The purpose of a District Plan is to assist territorial authorities to carry out their functions in seeking to achieve sustainable management of natural and physical resources (section 31, RMA 1991). District Plans provide a framework for the management of land use and development. For the case study used later in this research, the relevant District Plan is the Kāpiti District Council District Plan (KDC – DP), made operative in 2021.

In 2012, the Kāpiti Coast District Council introduced a plan change to address climate adaptation, including provisions related to coastal hazard management, introducing new coastal hazard zones and associated controls on development and land use (Jacobs, 2023). The proposed plan changes received significant opposition, escalating to legal challenges and public scrutiny. In 2013, following the commission of an independent review (see: Allan & Fowler, 2014), the proposed plan changes were withdrawn. The Takutai Kāpiti Coastal Adaptation Project, used as the case study for this research, was initiated in response to this plan change withdrawal.

The operative Kāpiti District Plan was adopted in 2021 but is currently going through a significant plan change process. The District Plan has seen improvements that better align with more recently published national directives and guidance on coastal adaptation. Through the case study – Takutai Kāpiti Project, as outlined later in this research – there have been influential changes, with updated coastal assessments incorporated to identify and prioritise areas that are vulnerable to coastal hazards.

Given the vast and complex coastline of Kāpiti, and its vulnerability to climate change impacts, coastal adaptation planning is a significant focus of district's planning framework. The 2021 Kāpiti District Plan introduced several objectives, policies and specific measures to address coastal adaptation planning. For example, DO-04 specifically relates to the protection of attributes of the coastal environment, including natural character, public access and recreational use. The Coastal Environment (CE) and Natural Hazards (NH) chapters are distinct, but they are interrelated in their focus and objectives. The CE chapter addresses the management and protection of the coastal environment, while the NH chapter addresses coastal hazards within the broader context of natural hazards.

3.3 The Local Government Act 2002

Another key Act which outlines the framework for local government operations in NZ is the Local Government Act 2002 (LGA). The primary purpose of the LGA is to provide for democratic and effective local government (s 3, LGA 2002). It enables and empowers local authorities to manage the needs and aspirations, and to be accountable to their communities. Long-term Plans prepared by local governments to cover a period of not less than 10 years are mandated by s 93 of the LGA (2002). By incorporating coastal adaptation measures (such as nature-based solutions) into Long-term Plans, local authorities can proactively address the facilitation and coordination of resources to ensure the sustainable management of coastal areas.

Sections of the LGA 2002 which are particularly relevant to coastal adaptation planning include section 10, which sets out the purpose of local government. Currently this includes the promotion of "social, economic, environmental, and cultural well-being of communities in the present and for the future" (s10(1)(b), LGA 2002). These are referred to as the 'four well-beings'. It is a cornerstone concept of local government legislation that is once again the topic of political discourse, after being reintroduced in 2019 by the Labour-led government. There has been recent discussion on the role of the four well-beings in the LGA and the direction of current reforms proposed by local government to refocus the attention of local councils on core services. For example, the Local Government Minister, Hon. Simeon Brown stated that "removing [the four well-beings] sends a clear message that councils must focus on roads, rubbish and reliable infrastructure" (LGNZ, 2024). There is potential that removal of the four well beings would narrow the focus of local councils and therefore compromise the long-term sustainability and resilience of coastal communities.

3.4 Te Tiriti o Waitangi (The Treaty of Waitangi)

The Treaty of Waitangi mandates a partnership approach that incorporates Māori rights, values and knowledge. Waitangi Tribunal documents consistently emphasize the principles of partnership, participation and protection in their interpretations (Hayward J, 2025). *Kawanatanga*, the right to 'govern' and *Tino Rangatiratanga,* the right to 'chieftainship or self-determination' are key principles of the first two articles of Te Tiriti o Waitangi which reflect the balance of power and authority negotiated between Māori and the Crown (Waitangi Tribunal, 1997). When applied in practice, examples include early partnership, joint decision-making and planning with Māori, to ensure Māori rights, interests, perspectives and knowledge are integrated into coastal adaptation planning outcomes (Lawrence J. , Bell, Blackett, Ryan, & Robichaux, 2019).

Of significance to this research is the statutory requirement to embed genuine consideration and accommodation of cultural values into NZ planning frameworks. The principles of Te Tiriti o Waitangi - The Treaty of Waitangi are incorporated into the RMA (1991) and the LGA (2002) and play a critical role in shaping policies and planning practices. Section 8 of the RMA (1991) requires that all persons acting under it "shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi)".

It is worth noting that under the successor to the RMA 1991, the NBEA 2023 had included a requirement that the principles of Te Tiriti o Waitangi (The Treaty of Waitangi) be given effect

to in planning and decision-making processes. However, following a change of government, this provision was repealed 123 days after its enactment. At the time of writing, there had been significant controversy and debate on the current Coalition Government, driven by the Act Party, which introduced the Treaty Principles Bill, to legislatively define the principles of The Treaty of Waitangi. While the Treaty Principles Bill did not proceed past its second reading, political uncertainty threatened to hinder the integration of Māori rights, values and knowledge into environmental and land use planning policies that are fundamental in seeking equitable and appropriate climate adaptation outcomes.

Matunga (2000) noted the incorporation of these concepts into NZ legislation is a necessity, as it supports the "reinsertion of tino rangatiratanga into New Zealand planning in ways that are real rather than semantic and illusory" (p. 46). Changes with regards to the role of Te Tiriti o Waitangi (The Treaty of Waitangi) through the Regulatory Standards Bill are also being considered, but not yet before parliament.

3.5 Marine and Coastal Area (Takutai Moana) Act 2011

The Marine and Coastal Area (Takutai Moana) Act 2011 is another important Act because it establishes the legal framework that affirms protected customary rights and customary marine titles for Māori. The Takutai Moana Act (2011) considers the Treaty of Waitangi (Part 1, Section 7) while also stating "neither the Crown nor any other person owns, or is capable of owning, the common marine and coastal area" (Part 2, Subpart 1, S11). This is significant in the context of coastal adaptation planning, because it affirms public rights such as access and navigation, while also enabling the protection of customary interests.

The Takutai Moana Act necessitates collaborative and culturally informed approaches to coastal adaptation planning. The Act requires that local authorities consider not only the physical and environmental factors, but also the customary interests and role of iwi and hapū in coastal adaptation planning.

3.6 National Climate Change Risk Assessment

In response to the global call for climate action, (as discussed in section 1.4) the NZ Climate Change Response Act (CCRA) 2002 was passed. Its purpose is to create a legal framework for NZ to meet its international obligations under the UNFCCC, the Kyoto Protocol and the Paris Agreement, this includes facilitating effective action to mitigate climate change and adapt to its effects. The Climate Change Response (Zero Carbon) Amendment Act 2019 is an amendment

to the CCRA 2002 which reflect the ambitions of the 2015 Paris Agreement and implement wider approaches to tackling climate change. The Act requires the Climate Change Commission to carry out a National Climate Change Risk Assessment (NCCRA) every six years, and this is used to inform the National Adaptation Plan (Ministry for the Environment, 2022). Both of which seek to manage and mitigate the effects of climate change on coastal communities and environments. For example, the NCCRA identifies 43 priority risks across five value domains: natural environment, human, economy, environment and governance. Ten risks are considered the most significant, requiring urgent attention, of which many relate to the coastal environment, refer Figure. 7 below.

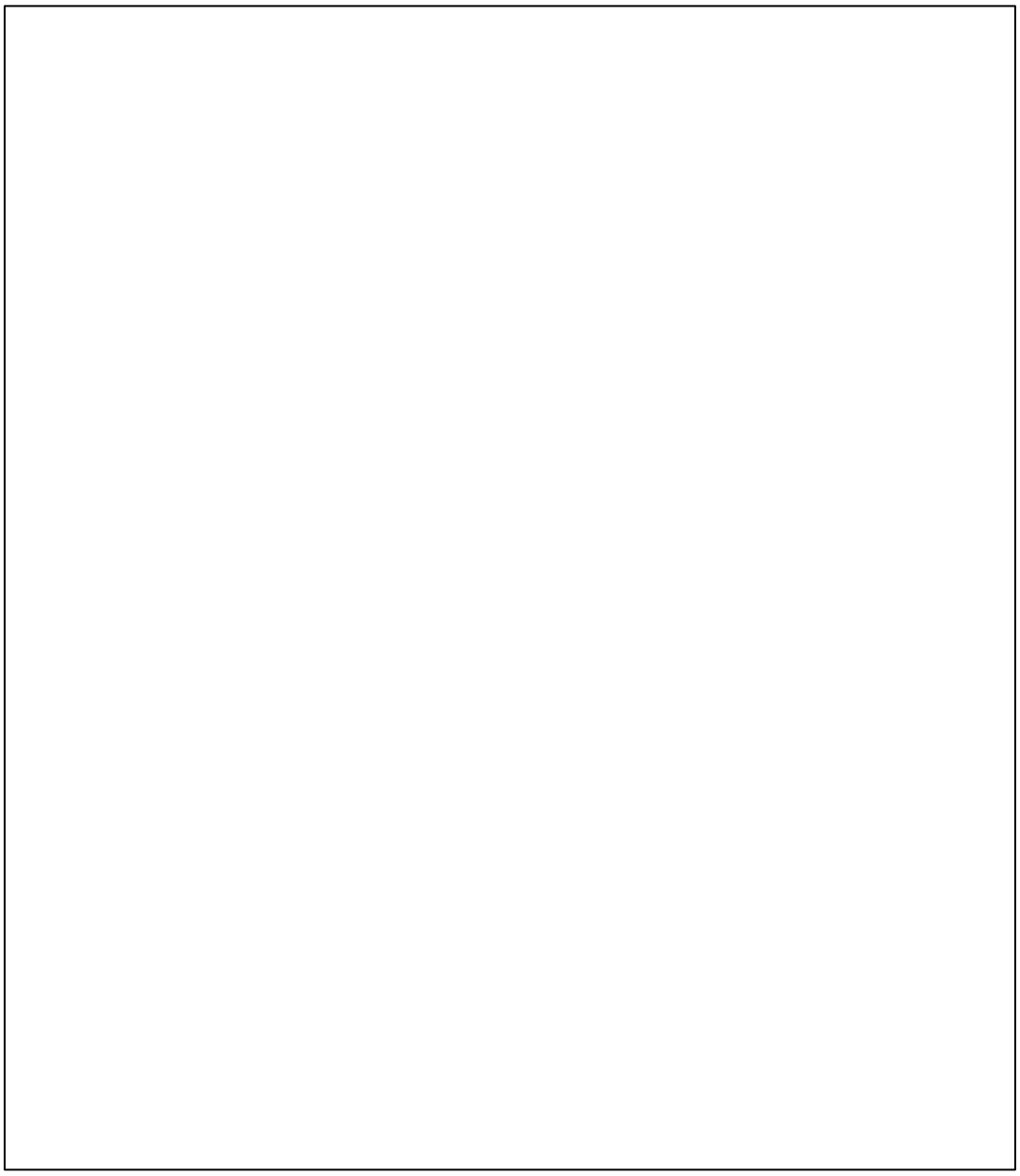

Figure 7: Top 10 climate change risks in NZ, based on rating of urgency (Source: NCCRA, 2020, pg. 9)

The NCCRA was adopted in 2020 and sets urgency ratings for adaptation, identifying the most significant risks for prioritisation in NZ. Regarding impacts on coastal environment, the urgency ratings range from major to extreme, with recognition that more research is required "before adaptation actions can be identified" with "significant consequences for coastal ecosystems, as well as social and economic systems" (Ministry for the Environment, 2020, pp. 43-51). The National Adaptation Plan (2022) responds to these risks.

3.7 National Adaptation Plan

NZ's first National Adaptation Plan (NAP) was released in 2022, it outlines a long-term strategic government approach to address the impacts of climate change. The NAP was developed to respond to the risks identified in the NCCRA, as outlined above. It also builds on earlier guidance from the Ministry for the Environment and updated scientific data provided by the IPCC (Ministry for the Environment, 2022). Recognising that climate change impacts, such as sea level rise and increased natural hazard events are inevitable, the NAP prioritizes risk-informed decision-making, with a focus on the most significant risks.

As discussed, the NCCRA identified major to extreme impacts on the coastal environment from climate change (Ministry for the Environment, 2020). In terms of coastal adaptation planning, the NAP emphasises proactive measures to address climate change impacts, including the development of tools to support adaptation, including retreat. Sections 66 and 74 of the RMA (1991) require that local authorities have regard to the national adaptation plan when preparing or changing regional and district plans.

3.8 Summary

New Zealand's planning framework operates under a comprehensive, hierarchical structure. The Resource Management Act (1991) mandates the sustainable management of natural and physical resources, to be achieved in a manner that gives effect to the principles of the Treaty of Waitangi (Te Tiriti o Waitangi), acknowledging the role of Māori as kaitiaki and ensuring respect for cultural values. This includes management of the coastal environment and climate change considerations.

Under the RMA 1991, the New Zealand Coastal Policy Statement 2010 provides national direction for the management of the coastal environment and some of the challenges for coastal adaptation. Regional Policy Statements and Regional Plans provide guidance on integrating coastal hazard management into planning processes. The Wellington Natural Resources Plan

applies a precautionary approach to risk-based planning and the protection of the coastal environment, while the Kāpiti District Plan implements these policies, with a focus on land-use controls. National adaptation efforts are further guided by the National Climate Change Risk Assessment (NCCRA) which identifies key natural hazard risks.

This section has highlighted key statutes within New Zealand's complex institutional framework to provide a foundation for coastal adaptation planning. Notwithstanding, challenges remain including the balancing competing values and uncertainties surrounding climate change risk. Through the alignment of planning instruments, and collaboration with Māori and communities, resilience is progressively addressed in relation to coastal climate risks.

Chapter 4

Research Design, Methodology and Data Collection

4.1 Introduction

This chapter outlines the approach applied in this study to answer the research question: What insights can be drawn from the Kāpiti Coast District Council's Takutai Kāpiti Coastal Adaptation Project about addressing landscape evaluation and risk assessment in climate adaptation planning. In order to answer this question, a qualitative research methodology has been applied to examine documentation from the case study that were available online, to understand the ways in which planners and policy makers have addressed risk and landscape values. As noted above (section 1.3), the scope of this research has been purposively limited in order to explore risk and values in the context of a contained suite of documents, within the constraints of a 120-credit thesis.

The primary objective of this research is to offer insights into the complexities of deciphering and interpreting risk and landscape values and to explore how they may be used to inform coastal adaptation planning. The case study: The Takutai Kāpiti Coastal Adaptation Project, situates this research in the context of a small west-coast settlement, Kāpiti Coast District, in the Greater Welling Region, in the North Island of NZ. Figure 8 below highlights the extent of the Kāpiti Coast District along the west coast of Wellington, it also shows the make-up of ward boundaries. There are limitations to this research, which are explained further in section 4.7.

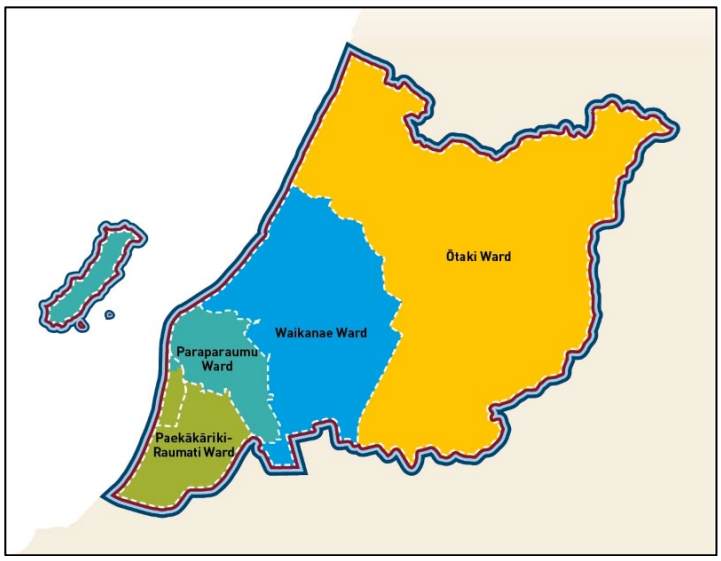

Figure 8: Kāpiti Coast District Ward Boundaries (Source: haveroursay.Kāpiticoast.govt.nz)

Document analysis was the primary research method, and data collected was collected from a suite of documents, as described in detail in section 4.5. Document analysis involved qualitative consideration of some of the factors that have influenced the perceptions of risk and value, drawn from the landscape assessments used to inform the Takutai Kāpiti Coastal Adaptation Project.

Document analysis also enabled exploration of how these factors that influence perceptions of risk and value aligned with the themes drawn from the literature review, including the concepts of power and governance in coastal adaptation planning and uncertainties related to climate change. It explored the ways differing knowledge bases and biased or subjective attributes of our environment are managed through the case study, and how this reflects the concepts drawn from literature. Using qualitative document analysis, the complexities that influence how we value our landscapes and respond to risk in the face of uncertainty are unraveled. The research provides insights that could be applied in value-based risk assessment, to inform coastal adaptation planning.

Throughout the following sections of this chapter, a systematic and qualitative approach to analysing existing documents and extracting data is described. Core documents from a singular case study that were determined to be of relevance to risk and landscape evaluation were analysed. Through this process, a thematic lens was applied in seeking to identify and understand how our perceptions of risk are interrelated with our perceptions of specific values of nature, and how these are addressed throughout the project. Broad themes were identified from the literature review, selected to epitomize core concepts derived from the literature, to be applied as a lens over the review of case study documentation, in seeking to extract relevant data. As presented in Chapter 2, the Concentric Framework for Coastal Adaptation Planning is applied in the context of the research method. Core concepts of this framework include the fundamental drivers of power and governance, notions of uncertainty and the influence of differing knowledge bases, social vulnerabilities, perceptions and understandings of risk and landscape values in coastal adaptation planning.

4.2 Qualitative Research to inform Coastal Adaptation Planning

The value of qualitative research is evidenced by consistent contributions in the field of strategic planning and policy making (Davies, Hoggart, & Loretta, 2002). The employment of qualitative approaches has become normalized, particularly in challenging ideas of representation. As Gibton (2016) explained, qualitative analysis has more of a focus on 'meaning making' and interpretation. Intrinsic matters are often revealed through qualitative analysis, and can include cultural or landscape values, sense of place, concepts of identity, worldviews, religion, beliefs and principles (Gibton, 2016). This research used a qualitative document analysis with the intention to generate greater meaning through the interpretation of data.

Document analysis was used in this study to provide a greater understanding of some of the varying ideologies, perceptions and differing knowledgebases that can influence planning and policy initiatives and drive outcomes in coastal adaptation planning. It followed an established approach to research in this area. For example, Wetherell (2012) explored the role of 'affect' and 'emotion' in social practices and how emotions influence the way people and communities act, both collectively and individually. Wetherell (2012) suggested that 'action' or 'affect' is intertwined with the causal effect of 'meaning making' and this often transpires through the documentation and reporting of human experiences, they "are the descriptions, justifications and explanations of activities that make up so much of everyday discourse" (p. 90). This example demonstrated how qualitative document analysis can be useful to draw insights from case study documentation and provide more nuanced insights from documented practices in coastal adaptation planning.

The value of analysing documents in social contexts was also described by Fairclough (2003) in his research on the social construction and interpretation of documents. He noted the significance of documents, shaped by the powers of social structure and social practices, documents can be representative of social agents of change. Documents are socially defined, produced, driven and consumed (Fairclough, 2003). Clark and Ivankova (2015) and Coffee (2014) build on this, explaining that data, elicited from existing documentation, can evoke a reflection of the aims and attitudes of the people that participated in the creation of those documents. For this research, qualitative document analysis is applied, using the Concentric Framework for Coastal Adaptation Planning, first presented in Chapter 2; this is to draw insights from NZ experience in coastal adaptation planning. The research seeks an in-depth understanding of the complexities of deciphering and interpretating risk and landscape values and how these can be addressed and used to inform coastal adaptation planning.

4.3 Document Analysis

Document analysis is a qualitative research technique that is useful as a method of collecting credible evidence to build on and support the research objectives, using a "systematic procedure for reviewing and evaluating documents" (Bowen, 2009, p. 27). For this research, the document analysis required the exploration of relevant case study documents, including documented processes and assessments on risk and value. A thematic lens was applied using the concentric framework as presented in section 2.5 above and included again below (Figure 9).

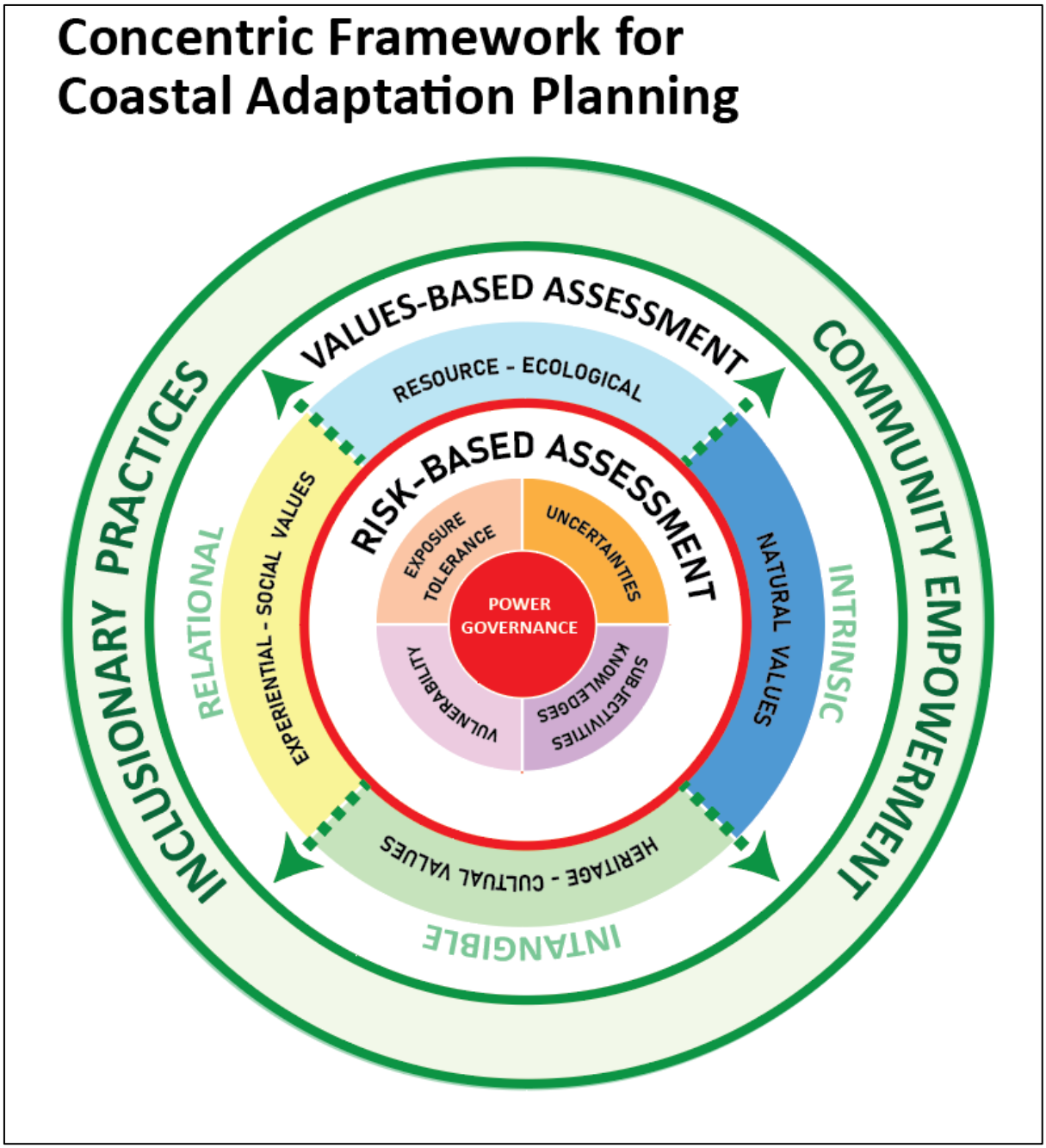

Figure 9: Concentric framework for coastal adaptation planning (Source: Author's own)

As described by Creswell (2009), critical interpretation (of the approaches and outcomes detailed in the documentation), and reflexivity (the process of self-reflection of interpretation), were pivotal factors in the qualitative analysis of documents. This was achieved by identifying the various actors and factors of influence in relation to risk and values assessment throughout the project and reflecting on concepts of power and governance and the role of the planner as a facilitator in coastal adaptation planning. Through this process, a deeper understanding is gained of the intrinsic nature of landscape values and the complexity of addressing matters that influence action, in the face of uncertain risks in coastal management.

Using the concentric framework developed from Chapter 2, the research applies a qualitative approach to document analysis. There is a mix of scholarly opinions on the use of qualitative analysis as a research tool during early planning and conceptualisation phases, particularly in social science contexts. Bryman (2016) suggested that decision-makers prefer quantitative research methodologies over qualitative approaches, because they rely on measurable and objective data to justify their decisions. Bowen (2009) emphasised different reasons for the application of qualitative document analysis in planning and policy reforms, suggesting it is useful as a primary research tool. Atkinson and Coffey (1997) and Corbin and Strauss (2008) cautioned that information gathered only from documents is not substantial enough to offer anything new. This is agreed by Bowen (2009) who stated that qualitative research methodologies cannot provide determinant or decisive solutions alone. However, he also stressed the advantage of qualitative methodologies over other quantitative means, particularly in the analysis of planning and policy documentation.

The disadvantages of relying on a single method of analysis are well noted and include the potential for insufficient detail, biased selectivity and irretrievability (Bryman, 2016). However, others argue there are benefits of qualitative approaches that outweigh these limitations, including the gathering of rich, contextual insights and in-depth understandings of human experiences. Gaining a deeper understanding of the ways in which we perceive, decipher and interpret information on risk and landscape values in coastal adaptation is a core objective of this research.

4.4 A Singular Case Study Approach

A systematic review was undertaken of documents (published on the Kāpiti Coast District Council's website) associated with a singular case study; the Takutai Kāpiti Coastal Adaptation Project. As noted in section 3.2.3 above, the Takutai Kāpiti Coastal Adaptation Project was initiated in response to the 2013 withdrawal of coastal hazard provisions, included with proposed plan changes to Kāpiti Coast District Plan. The provisions related to coastal hazards generated significant opposition, particularly concerning the technical identification and mapping of coastal hazard areas, and the restrictions and controls imposed on those areas.

The use of a singular case study is validated by Yin (2018) and Flyvberg (2006) who suggested a single case study can elicit context rich insights. While there are limitations to using one example, including the potential for generalizability and researcher bias, it is considered this is appropriate for the purposes of this research. In this instance, a singular case study allows for a holistic analysis that offers depth and meaningful insights into the varying dynamics of coastal adaptation planning within a coastal community.

With the background documentation associated with the project readily and publicly accessible, the project presents as a useful and compelling case study. A comprehensive level of documented discourse is available, and this allows for an in-depth exploration of the complexities of social vulnerability, risk and landscape values and how they are addressed in coastal adaptation planning. Analysis of the documentation will evoke a greater understanding of the complex and multifaceted dynamics of deciphering and interpreting risk and landscape values, and how these are used to inform value-based risk assessment in coastal adaptation planning. It will provide insights on the trade-offs and conflicts that can arise in the context of coastal adaptation planning, and how these matters might be addressed. The extensive level of project documentation offers a rich context for examining how the diversity of perspectives of risk and value are negotiated and integrated into a long-term coastal adaptation strategy.

Focusing on one case study is ideal for the exploration of complex matters, in which dynamic and personable variables are not well understood. The analysis will generate insights that may be tested and explored further with other case studies. This qualitative case study documentation analysis seeks an in-depth understanding of the influential variables of risk and value arising in the Takutai Kāpiti Coastal Adaptation Project and insights as to how they are addressed in comparison to the conceptual frameworks drawn from the literature review. The results of this

research are intended to be useful, enhancing coastal adaptation planning practices for other vulnerable coastal communities of NZ.

4.4.1 Case Study Selection: Takutai Kāpiti Coastal Adaptation Project

The case study used was the Kāpiti Coast District Council's coastal adaptation project, Takutai Kāpiti. The Kāpiti coastal adaptation project, Takutai Kāpiti, is a Council and community led initiative, designed to develop and implement strategies to avoid or mitigate the impacts of climate change on coastal areas within the Kāpiti Coast district. It was chosen for use as a case study partly for practical reasons, a full suite of relevant documents were publicly available on the Council's website. It was also selected as a case study because it is representative of the unique geographical, cultural and governance contexts that are characteristic of many coastal communities exposed to coastal hazards across New Zealand (as explained below). As a completed coastal adaptation planning project, the availability of documents online also made it a useful case study.

The Kāpiti coastline is located on the southwest coast of the North Island of Aotearoa-New Zealand and is approximately 38km long. Kāpiti district is home to a diverse population of approximately 53,000 residents, of which 14% are Māori (Stats NZ: Tatauranga Aotearoa, 2024). As a coastal community, Kāpiti faces significant environmental challenges that are likely to intensify with ongoing climate change. Of note, the Kāpiti Coast District Council's website: 'Have Your Say' stated "like many coastal communities around New Zealand, Kāpiti faces significant environmental challenges caused by changing climate and associated rising sea levels" (Kāpiti Coast District Council, 2024).

For Takutai Kāpiti the 'Community Advisory Panel' was the formal mechanism through which wider community input and indigenous knowledges are synthesized for the purposes of Takutai Kāpiti. The CAP is described as a 'conduit' and a voice for the wider community. It included iwi representatives who liaise and provide feedback from their iwi rūnanga and members. Accompanying this, various methods of community engagement and participation are utilised to reach a wide breadth of the community. Objectives are then specifically tailored for defined adaptation areas, based on the value positions ascertained through local level assessment and participation.

The district-wide coastal adaptation project was developed in response to a plan change withdrawal that resulted in significant opposition. In seeking to prevent a recurrence, the project was undertaken across four phases, as identified in Table 1 which outlines the suite of

documents analysed. As provided in the Terms of Reference (2022) for Takutai Kāpiti, the four phases are:

1. The initial launch of the project and co-design of the community led process, and establishment of the Community Advisory Panel.
2. Develop recommendations for coastal adaptation strategies, to be considered for adoption by Council, with input from:
    i. Professional expertise, and
    ii. Community input.
3. Adopt recommended pathways towards coastal adaptation.
4. The final phase is the ongoing monitoring and implementation of the strategies.

In its approach to coastal adaptation planning, phase one of the Takutai Kāpiti project set the scope for the project, noting the need for different potential adaptation pathways, overtime (MacDonald & Blazey, 2022). During this early phase, five adaptation areas were demarcated by their similarities in coastal morphology, processes and hazard exposure, as outlined in the Decision-Making Framework (DMF) report (MacDonald & Blazey, 2022, p. 11), these included:

- Similarities in the susceptibility and vulnerability to coastal hazards.
- Similarities in local processes occurring (e.g., sediment supply, sediment transport)
- Density of population and infrastructure
- Present day coastal management practices (e.g., structured/non-structured)
- Limit of coastal influence on flooding and groundwater levels
- Common catchments.

Kāpiti Island was not included in the hazard assessments because adaptation pathways for Kāpiti Island were to be managed outside of the Takutai Kāpiti processes. (MacDonald & Blazey, 2022, p. 22).

The extent of the five adaptation areas are illustrated in Figure 10 below. These include Northern Kāpiti (including Ōtaki, Te Horo, and Peka Peka), Central Kāpiti (Waikanae and Paraparaumu), Raumati, Paekākāriki, and Queen Elizabeth Park. Each area was assessed for coastal hazard exposure and vulnerability, forming the basis of technical data, used to inform pathways towards adaptation.

Figure 10: Adopted Coastal Adaptation Areas (Source: DMF, 2022, pg. 22)

Takutai Kāpiti is an example of contemporary planning practices in New Zealand, making it useful case study to compare with examples of global best practice and national directives in coastal adaptation planning and management. The case study provided an opportunity for an in-depth analysis of the drivers of risk and landscape value that interact, shape and accelerate coastal adaptation planning efforts. By focusing on one comprehensive example of coastal adaptation planning, this study aims to provide insights into the processes, challenges, and outcomes of coastal adaptation planning in practice.

4.5 Data Collection, Collation, Coding and Analysis Plan

Objective 3 of this research was to apply the developed Concentric Framework for Coastal Adaptation Planning to the selected case study. Following this research design, insights from the Kāpiti Coast District Council's Takutai Kāpiti Coastal Adaptation Project about addressing landscape valuation and risk assessment were able to be compared to the literature, and specifically the IPBES (2022) conceptual framework on values of nature, thus achieving this objective.

The data collection, collation and coding necessary for this research occurred across four key processes (post-literature review), as illustrated in the flow chart below (Figure 11). This section details the first three steps in this chart.

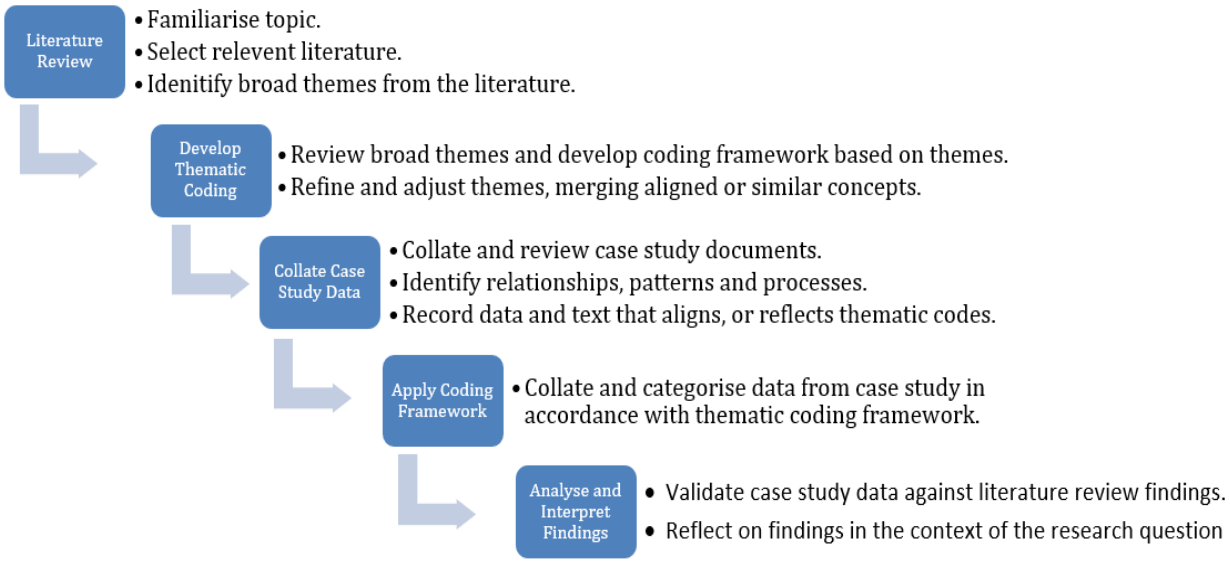

Figure 11: Flow chart showing the process of data collection, collation, coding and analysis (Source: Author's own)

These processes included the identification of broad themes or concepts from the literature review, development and refinement of these themes and concepts into a more comprehensive thematic coding framework. This was then graphically developed into a Concentric Framework for Coastal Adaptation Planning, as presented in section 2.5, Figure 9. This framework was applied to gather data from the case study, a more detailed example of this process is provided in the data analysis plan outlined in the following subsections.

4.5.1 Step 1: Select and Review Literature

Before delving into the detailed literature review, a preliminary task involved a high-level review of the research topic: coastal adaptation planning. The purpose of this preliminary review was to gain a foundational understanding of the topic and identify current trends and issues relevant to coastal adaptation planning. The interrelation of risk and value assessments in coastal adaptation planning was identified through this process as an emerging topic of interest that warranted further investigation.

Both risk-based assessment and values-based assessment, used to inform coastal adaptation planning, were selected as the overarching topics in which the thematic coding units were nested. Two additional topics were identified relevant to the implementation of coastal adaptation, these were broadly defined by contrasting scales of action: global and local. The thematic coding units were developed into a concentric framework for coastal adaptation planning.

4.5.2 Step 2: Develop Thematic Coding and Concentric Framework

Within each topic, recurring patterns and emerging concepts were merged and selected as thematic coding units. For example, the research found there are numerous complexities and intricacies of risk assessment. These were merged into four broad, but significantly influential factors of risk assessment and included: uncertainties, differing perspectives and subjectivities of risk, alongside intersections of vulnerability and exposure in defining risk tolerances.

Figure 12 illustrates the relationship of the underpinning concepts of risk assessment, as drawn from the literature, and shows how risk assessment is influenced by notions of power and governance.

The themes identified in the Concentric Framework for Coastal Adaptation Planning were applied in steps 4-5 of the data analysis plan. The dynamics of value-based assessment and its relationship to risk assessment and community legitimisation was also identified from the literature as a significant concept in coastal adaptation planning.

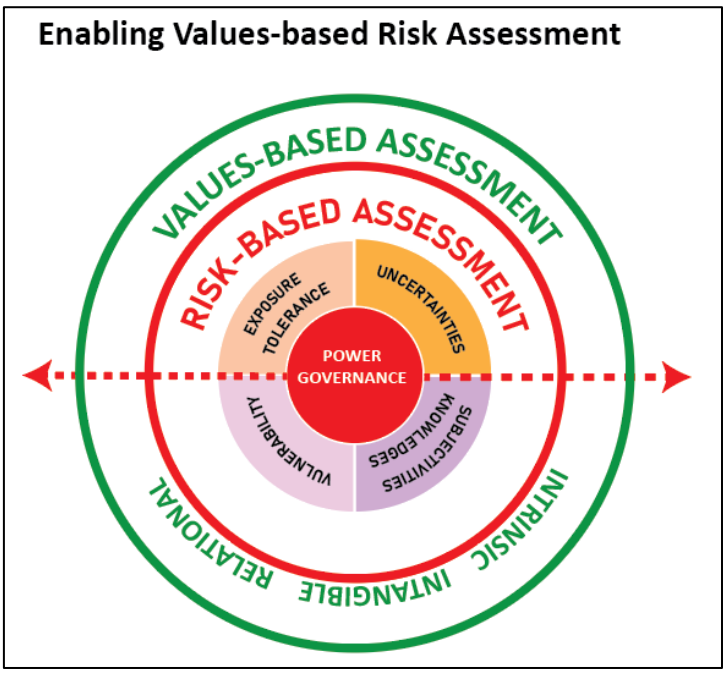

Figure 12: Underpinning themes of risk assessment (Source: Author's own)

The significance of addressing specific values of nature in risk assessments was identified, these included relational and social values, intangible or intrinsic natural values, heritage and cultural values and resources. These matters were selected as additional thematic coding units, to gain a comprehensive understanding of the broader topic of value-based assessments, and how they are used to inform coastal adaptation planning. Derived from the concepts drawn from the literature review (see section 2.4), the thematic codes reflect the concepts captured in the Concentric Framework for Coastal Adaptation Planning (refer figure 13 below).

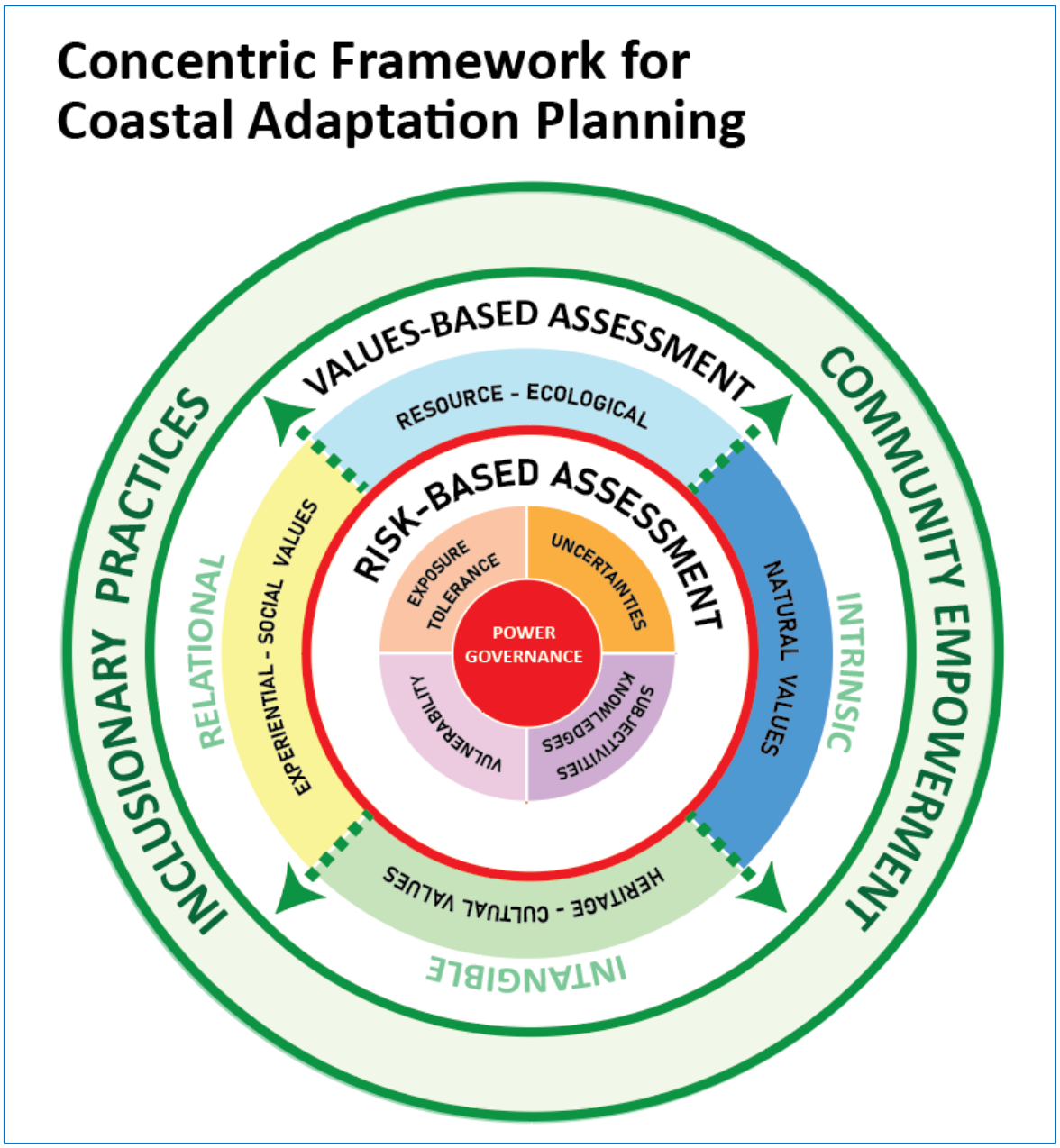

Figure 13: Underpinning concepts of coastal adaptation planning (Source: Author's own)

4.5.3 Step 3: Data Collection

The primary purpose of the data collection and analysis was to gather a rich and thorough understanding of issues relevant to coastal adaptation planning in New Zealand. Specifically, text within the documents was analysed to explore the deciphering and interpretation of risk and landscape values, and how these are used to inform coastal adaptation planning – i.e. the data.

Takutai Kāpiti Coastal Adaptation Project Data Collection

When gathering data from the case study, the thematic coding from the concentric framework was applied, inferred by the underlying concepts and themes drawn from the literature review (Fig. 10, also refer Table 2, section 2.4). The colour coding provided in Table 2 -Appendix 1, also shown in Figure 14 below, connects directly to the Concentric Framework for Coastal Adaption Planning.

VALUE-BASED RISK ASSESSMENT IN COASTAL ADAPTATION PLANNING									
Global	**Risk-Based Assessment** Key Authors: (Lupton, 1999; Ulrich, 2006)				**Value-Based (Landscape) Assessment** Key Authors: (Brown, 1984; Fritzche & Oz, 2007)				**Local**
Power and Governance	**Uncertainty**	**Exposure and Tolerance**	**Vulnerability**	**Subjectivities and Perceptions**	**Heritage – Cultural Values**	**Relational - Social**	**Natural Values**	**Resource / Eco-Services**	**Participation and Engagement**
Exclusivity of expertise and erosion of trust; rights movements. (Thomas, Phillips, Lovekamp, & Fothergill, 2013; Lave, 2015; Inmaculada de, 2018)	*Climate change uncertainties and complexities* (Rittel & Webber, 1973; Anderson, 2010; Wisner, Gaillard, & Kelman, 2011; Weinkle & Pielke, 2017)	*Local variations of vulnerability and resilience.* (Concha-Homes & Oliver-Smith, 2019)	*Indirect exacerbation of vulnerabilities from socially and structurally biased approaches to adaptation.* (Ulrich, 2006; Begum, et al., 2022)	*Differing knowledges, social learnings and accepting the unacceptable.* (Glavovic & Smith, 2014)	*The significance of cultural and heritage attributes of landscapes on identity and belief.* (Hanara & Jackson, 2019; Dioniso, Walker, Macfarlane, Yates, & Matunga, 2024)	*Influence of natural attributes on social connection and wellbeing.* (Chiesura, 2003; Rulleau & Rey-Valette, 2017)	*How we value intrinsic landscape values such as natural character.* (Cassatella & Peano, 2011; Potschin, et al., 2016; Pascual, et al., 2022)	*Valuing landscapes for resource and eco-services.* (Lowenthal, 1978; Adger, Hughes, Folke, Carpenter, & Rockstrom, 2005; McHarg & Steiner, 2006; Pascual, et al., 2022)	*Building local adaptive capacity and resilience to coastal hazards.* (Adger, Hughes, Folke, Carpenter, & Rockstrom, 2005; Wisner, Blaikie, Cannon, & Davis, 2004)

Figure 14: Snapshot of colour-coded themes drawn from the literature review and applied; also see Appendix 1.(Source: Author's own)

As Burns (2000) noted, coded units should be "congruent with the research purpose and mutually exclusive" (p. 471). In this instance, the coding units were derived from the literature and are reflective of the purpose of the research, i.e., to explore how risk and landscape values are expressed through documented assessments, and to offer insights into the accommodation and preservation of landscape values, alongside considerations of risk. in coastal adaptation planning.

The data extracted for the research discussion was systematically gathered from documents published on the project website in relation to the Takutai Kāpiti Coastal Adaptation Project. Table 1 below provides a record of the documents analysed for the purpose of this research, it also highlights the phase of the project, for which it relates.

Table 1: Record of Documents - Takutai Kāpiti Coastal Adaptation Project

	Case Study Documents Reviewed: Takutai Kāpiti Coastal Adaptation Project			
Acronym	**Document Title**	**Year**	**Phase**	**Content Outline**
TKP	Takutai Kāpiti Project (website)		**All**	2023: Documents added as made available, including TOR pre-refinement. 2024: Website updated to reflect completed project, some documents no longer available.
TOR	Takutai Kāpiti Coastal Advisory Panel and Co-Design Working Group	**2022**	**1**	Outlines parameters for project and key objectives for panels consideration including public engagement, a multitude of values and cultural and expert input. Appendix 2 is helpful in that it provides a background to the proposal, including how the proposal was initiated because of earlier plan change proposals that were ultimately withdrawn and revised based on the project outcomes.
DMF	Takutai Kāpiti: Coastal hazards adaptation decision-making framework)	**2022**	**2A**	The purpose of the report is to turn learnings regarding coastal hazard risk exposure and values into a set of recommendations.
CHZSV	Kāpiti Coast Coastal Hazards Susceptibility and Vulnerability Assessment	**2022**	**2A**	Provides base data on risk from a coastal science and engineering perspective, explains prioritisation of areas and outlines uncertainties.
TH-SC Report	Coastal Risk-Based Planning: Thresholds and Scenarios Report	**2023**	**2A**	Provides technical advice on risk-based planning and summarises KCDC's obligations under the RMA 1991, provides examples of how a risk-based approach could be applied.
CVA	Cultural Values Assessment Report for the Takutai Kāpiti	**2023**	**2B**	Iwi perspectives in this report do not represent Ātiawa ki Whakarongotai. Includes: Te Ao Maori; Cultural Values; Historic Pa and Papakainga; Marae; Wahi Tapu; Ancestral Landscapes; Environment Health; People and Environment; Thoughts for Future.
SIA	Takutai Kāpiti Social Impact Assessment	**2024**	**2B**	Covers the communities of Otaki, Te Horo, Peka Peka, Waikanae, Paraparaumu, Raumati and Paekākāriki. Detailed methodology including semi-structured interviews.
NCE	Kāpiti Coast Natural Character Evaluation	**2024**	**2B**	Assessment jointly commissioned by KCDC and GWRC to evaluate levels of natural character to give effect to the requirements in the Wellington Regional Policy Statement (RPS) and the New Zealand Coastal Policy Statement (NZCPS) 2010.
ECO	Kāpiti Coast Ecological Values Review Report	**2024**	**2B**	Maps the intersection of hazard exposure with the spatial extent of ecological features.
Raumati Report	Coastal Advisory Panel Engagement Summary Report: Raumati Adaptation Area	**2023**	**3**	First community engagement summary report produced. Based on responses from community in-person workshops in July 2023 and the survey of April-May 2023.
Northern Area Report	Coastal Advisory Panel Engagement: Northern Adaptation Area Summary	**2023**	**3**	Based on responses from earlier, but related, in-person workshops in August 2022 and the online survey of April-May 2023.

Paekākāriki Report	Coastal Advisory Panel Engagement Summary Report: Paekākāriki Adaptation Area	**2023**	**3**	Based on responses from community in-person workshop in November 2023 and the online survey of April-May 2023.
Central Area Report	Coastal Advisory Panel Engagement: Central Adaptation Area Summary	**2023**	**3**	Based on responses from in-person workshops in May 2023 and the online survey of April-May 2023.
TKPCAP Final Report	Takutai Kāpiti Coastal Hazard Adaptation Project: Report of the Independent Coastal Advisory Panel	**2024**	**4**	Presents the evaluation process and recommendations of the CAP, the report recommends a dynamic adaptive pathway planning method and acknowledges there is still work to be done in determining specific community signals, triggers and thresholds.

To better understand the progression of the assessments and how they were used to inform the project, the documents were assessed in sequential order, with each presented as an expansion on the preceding. The intention of this approach was to demonstrate the pivotal influence that a consolidation of information on landscape values and perceptions of risk can have on the direction of coastal adaptation planning practices.

Each of the documents from the case study provided contextual information, including information of disciplines and methodological approaches, institutional drivers and geographical scope, matters that influence how differing professions capture how we perceive and respond to coastal hazard risks. In the context of uncertainties relevant to climate change, this research sought to better understand the ways in which differing, and sometimes conflicting values and perceptions are managed in coastal adaptation planning.

The purpose of this research is to help prepare and enable planners and policy makers to make informed recommendations in coastal adaptation planning. A comprehensive analysis of the case study documentation provides a foundation for understanding how landscape values shape the way we approach and manage risk, in an applicable context. Data obtained from these records were also helpful to understand the complexity and dynamics of values and perceptions of risk in coastal adaptation planning.

Pilot Study

A pilot of the case study documentation was undertaken before delving into the thematic coding required to progress the research through step 4 (ref Fig.11). This preliminary step also provided an opportunity to validate the themes.

During this stage it was determined that certain documents did not align with the objectives of the research, such as the Economic Analysis of Takutai Kāpiti Short-listed Coastal Adaptation Pathways (2024). This document was excluded from the detailed analysis.

4.5.4 Step 4: Apply Thematic Coding and Collate Data

The case study documentation, as detailed in section 4.5, was reviewed and extracts of data were organised chronologically into a table and coded as per the themes used in the Concentric Framework for Coastal Adaptation Planning, above (section 4.5.2, Figure 13). Recording the dates that documents were published was important to understand the order and progression of information as the project developed and the influence and relationship between documents. The documents were examined in the order in which they were published.

Table 2: Example of collation of data and applied coding

#	Date	Document Details	Uncertainty	Risk Exposure / Vulnerability	Community Engagement	Power and Governance
1	March 2022	**TOR 2022:** *Outlines parameters for project and key objectives*	"Me huri whakamuri, ka titiro whakamua. Utilising our **past to inform our future**." (p. 1)	" Taking into account **technical advice** in consultation **with community**" (p. 2)	"**co-design** the project and **community-led** process" (p. 2)	Community Assessment Panel to include mandated iwi representatives, community and other key stakeholder representatives
			"Significant environmental challenges from our changing environment" (1) "hazard lines … not sufficiently robust"(p.8)	"develop a **range** of **options, based upon agreed trigger points**" (p. 2) "strike an appropriate balance "(p. 2)	"…determine, in consultation with the wider community, the preferred option(s)" (p.2) "social license to proceed" (p. 2) "the preference is to achieve consensus"(p.3)	"consistent with national and regional direction" (p.2) "Decision on if, or how, implementation will be funded is beyond the mandate".(p.3)

4.5.5 Step 5: Thematic Analysis

Thematic analysis is a research method used to identify, analyse and report on recurring patterns or themes from a qualitative data set. It is particularly useful for analysing case study documentation (Braun & Clarke, 2021). Braun and Clarke (2006) suggests "thematic analysis should be considered a method in its own right … through its theoretical freedom, thematic analysis provides a flexible and useful research tool, which can potentially provide a rich and detailed, yet complex account of data" (p. 78).

As Figure 11 illustrated, the first analysis strategy was to refer to the theoretical propositions of the literature review, for each of the coded units (refer section 4.5.1). The final step involves analysis and interpretation of the findings. Meeting the first objective of the research, the data is explored to identify patterns, relationships and other meaningful data on the assessment of risk and value in relation to coastal adaptation planning. The second objective is to provide insights from Kāpiti Coast District Council's Takutai Kāpiti Coastal Adaptation Project about addressing landscape valuation and risk assessment, as they compare with the IPBES (2022) framework on values of nature.

4.6 Research Limitations

There are several limitations in the use of this research. First, the use of a single case study, as outlined previously in section 4.3. Due to the unique nature of local factors, the generalizability of the study is limited, applicable to a particular niche of coastal communities across New Zealand. Furthermore, by focusing on local adaptation efforts, regional and national positions may become subordinate with misalignment of outcomes. Additionally, the reliability and validity of the findings are inherently limited by using a single case study. Using a singular case study, the ability to generalize the results against broader populations is restricted. To ensure greater reliability and validity, this could be improved with further research, using multiple case studies and the incorporation of additional data sources to expand on the findings.

Another limitation is the use of short-term data within the documentation, and the omission or reliability of the data used to create the case study documentation. These are limitations which may affect the robustness of the research overall. While some of these concerns could have been overcome by increasing the sample of case studies, and extending the duration of the study, this was not a possibility due to time constraints and limited resourcing.

Notwithstanding, the research has established a systematic way of exploring coastal adaptation planning using the Concentric Framework for Coastal Adaptation Planning, so methodologically, it presents a useful outcome. The application of this approach was found to be useful, therefore achieving the second objective of this research, providing the means for experiences to be drawn from coastal adaptation projects that offer insights into the accommodation and preservation of landscape values alongside, considerations of risk when planning for coastal adaptation.

4.7 Code of Conduct and Ethics

This research was undertaken in adherence with the Massey University Code of Conduct for Research (2021) and other ethical conduct guidelines. Ethical considerations are fundamental to the conduct of responsible research. The Code of Conduct provides guidance for researchers in maintaining ethical standards. Key principles are set out including integrity, respect for people and intellectual property, and social responsibilities in relation to the conduct of research.

This study did not involve human or animal participants and did not require the collection of personal or sensitive information from individuals. Instead, it relied on the analysis of existing documents, reports and other publicly available material. Therefore, no further consideration of Massey University's Code of Ethical Conduct for Human or Animal Research was necessary.

Throughout this research it is sought to maintain research integrity and respect in accordance with the Massey University Code of Responsible Research Conduct (2018). The means of data collection and analysis are transparent, with careful documentation of sources and methodologies, ensuring the research can be further assessed or replicated by others. The research aims to make an original contribution to the field of coastal adaptation planning. Findings are presented as my own work, with due acknowledgement of others where necessary.

All sources of information have been cited and are acknowledged appropriately, respecting the intellectual contributions of other researchers. The documents analysed are all publicly available, with personal identifiers generally anonymized by the source, or otherwise withheld from this report. Overall, the research aligns with the key principles of integrity, respect and social responsibility set out in the Massey University's Code of Conduct for Research (2021).

4.8 Summary

This chapter described how a specific example of coastal adaptation planning could be interrogated to collate evidence of the subjectivities around perceptions of risk, landscape value and the interrelations of vulnerability, governance and local empowerment. It uses the Concentric Framework for Coastal Adaptation Planning, that is, the key themes synthesised from the literature, including power and governance, risk assessment and value-based assessment.

The third research objective was to draw insights on coastal adaptation planning, in relation to the assessment of risk and value. This is achieved by comparing the practice example, documented through the case study, with the concepts and themes drawn from the scholarly literature. This process exposed both consistencies and gaps, providing insights and learnings for coastal adaptation planning practitioners. The following chapters present and discuss the findings of the qualitative document analysis undertaken.

Chapter 5
Research Results and Discussion

5.1 Introducing Takutai Kāpiti: Framing the interplay of risk and value

Planning for coastal adaptation, in the face of climate change increasingly requires planners to navigate not only the assessment of physical risk, but also diverse and often conflicting values (Kilvington & Saunders, 2019). This chapter explores and discusses the findings of a thematic document analysis on risk and value assessment in coastal adaptation planning, using the Takutai Kāpiti Coastal Adaptation Project as a case study (section 4.3).

The Takutai Kāpiti Coastal Adaptation Project website states that, "like many coastal communities around New Zealand, Kāpiti faces significant environmental challenges caused by changing climate and associated rising sea levels" (Kāpiti Coast District Council, 2024). The case study presented a recent example of the challenges and opportunities facing coastal adaptation planning. The research exposed relationships between knowledges, perceptions of risk, value-based assessment and decision making for coastal adaptation in contemporary planning practice.

The discussion is structured around four inter-related themes, drawn from the Concentric Framework for Coastal Adaptation Planning: governance and power, risk assessment, values-based assessment and community empowerment, alongside considerations of global and local action. The framework consists of rings and arrows that commensurate to pathways towards coastal adaptation planning.

Figure 15 below emphasises these interrelated elements of coastal adaptation planning. The suite of documents analysed were detailed in section 4.5, these were interrogated for data to answer the research question. Identifying insights from the Kāpiti Coast District Council's Takutai Kāpiti Coastal Adaptation Project about addressing landscape valuation and risk assessment, as they compare with conceptual frameworks on climate adaptation planning. The findings present a useful starting point for further discussions around the broad context of coastal adaptation planning.

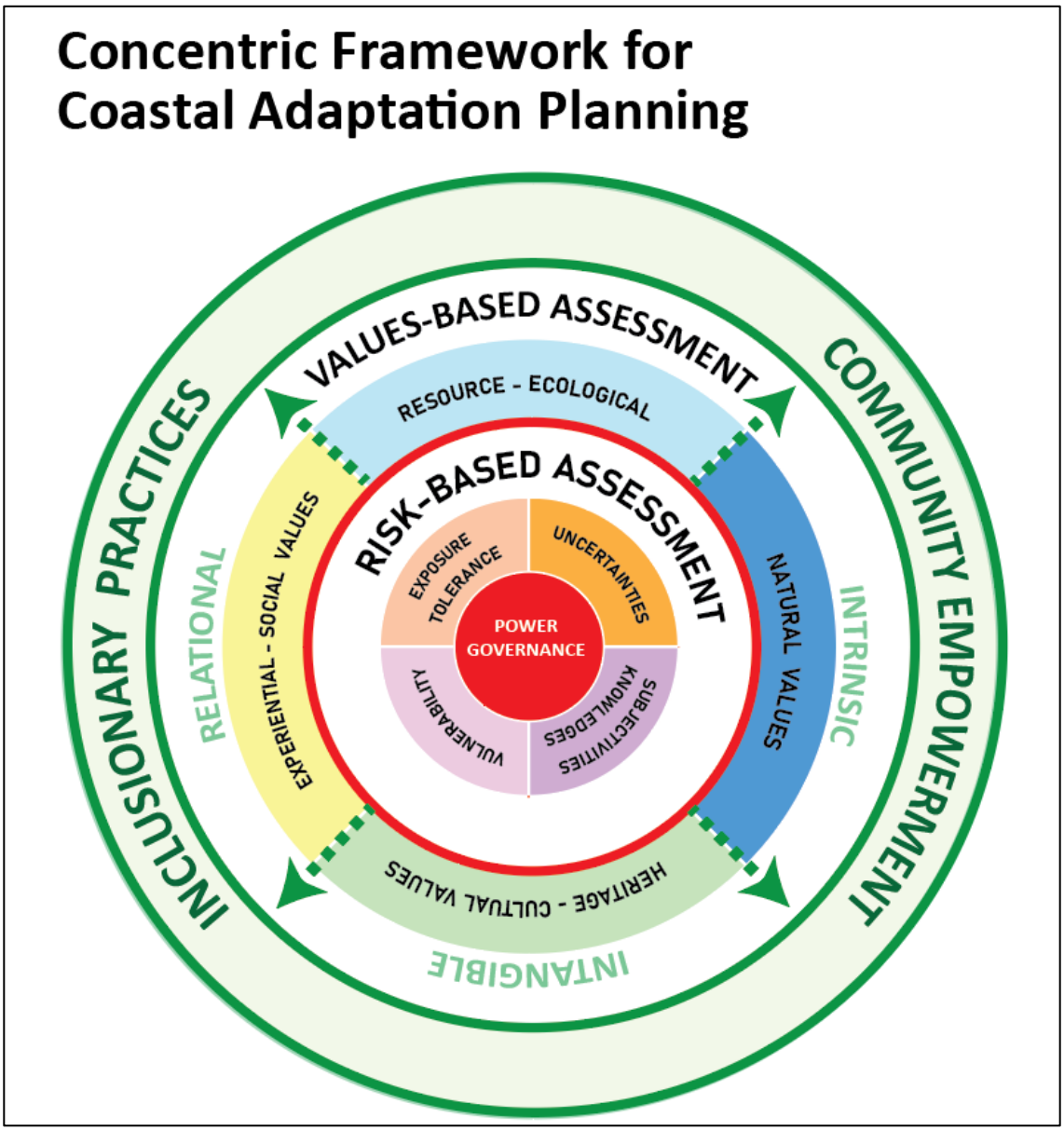

Figure 15: Integrated Coastal Adaptation Planning Framework (Source: Author's own)

5.2 The Role of Governance and Power in Takutai Kāpiti

Central to the Concentric Framework for Coastal Adaptation Planning, governance and power are central agents of change in coastal adaptation planning (Beck, 2006; Thomas, Phillips, Lovekamp, & Fothergill, 2013). Effective governance (Ericksen, Berke, Crawford, & Dixon, 2003), inclusionary planning practices (Elling, 2017) and the concept of pastoral power (Kamete, 2011) are pivotal in driving and facilitating action towards coastal adaptation, as illustrated by the red arrows in Figure 16 below. To achieve effective governance in coastal adaptation planning, decision-makers, planners and the community are central to the enablingof greater planning outcomes that enhance the capabilities and resilience of communities (Rubooga, 2024).

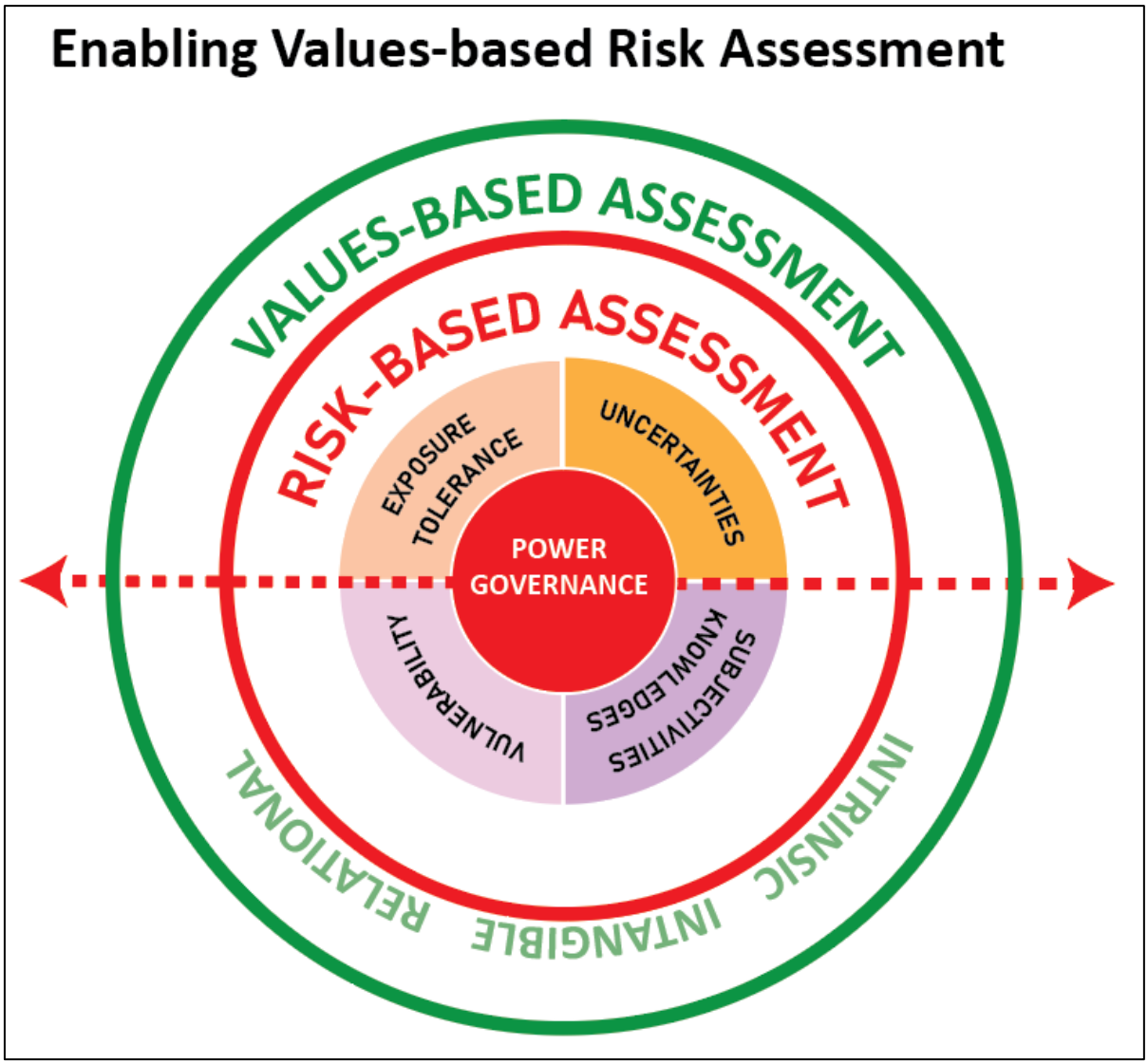

Figure 16: Effective governance is central to enabling value-based assessment in coastal adaptation planning (Source: Author's own)

Coastal adaptation planning requires the navigation of a hierarchy of governance, cross-sector perspectives and the bridging of national and community expectations that are sometimes polarising (Rubooga, 2024). Examining and reflecting on the Takutai Kāpiti Coastal Adaptation Project process revealed how coastal adaptation is governed across these scales, from their national commitments to local deliberations on the management of coastal hazards.

In the case of Takutai Kāpiti, the span of governance is evidenced in the make-up of the Coastal Advisory Panel, which "was co-designed by Council and a working group of iwi partners, Coastal Ratepayers United, North Otaki Beach Residents Group, Waikanae Estuary Care Group, and GWRC [Greater Wellington Regional Council] staff" (Takutai Kāpiti: Coastal hazards adaptation decision-making framework, 2022, p. 11).

The complexities of addressing climate change within an evolving political landscape were revealed in the examination of the background information provided in the TOR document. During the period leading up to the project, the political landscape of NZ was marked by discussions focused on the impacts of climate change, with an emphasis on addressing climate resilience through community-driven adaptation planning.

As discussed in Chapter 3, proposed plan changes that introduced new coastal hazard provisions into the Kāpiti Coast District Plan received significant opposition and public scrutiny. Following the commission of an independent review (see: Allan & Fowler, 2014), the proposed 2012 plan changes were withdrawn. With the slow introduction of national guidance, and despite political focus on localised climate resilience, the earlier attempt to introduce coastal hazards into the Kāpiti District Plan was significantly impacted. It received significant opposition and public scrutiny on the methods and approaches undertaken in developing the proposed provisions related to coastal hazard mapping and restrictions.

The TOR made mention of the 2012 proposed plan change, which provided insight on the complications encountered, for example, the TOR (2022) noted that "there were 777 submissions on the PDP (around 400 of which related to coastal matters)" (pg. 8), as well as "filed applications for declarations [related to the assessment and mapping of coastal hazard areas] in the Environment Court" (pg. 10). The TOR (2022) also stated that due to the level of community opposition and legal challenges the 2012 plan change was "subsequently withdrawn in 2014 and 2017", prompting a reorientation towards a "community-led process" (pg. 1). Takutai Kāpiti was founded to respond to the fall out of this plan change. The objective of Takutai Kāpiti, as set out in the TOR (2022), was to deliver a set of recommendations to Council, so that they would then have "the social license to proceed with the coastal plan change" (p. 2). The course of Takutai Kāpiti demonstrated the susceptibility of planning to politics (Conacher, 2000) and highlights the need for planning approaches to coastal adaptation that are politically responsive (Glavovic & Smith, 2014).

This research has shown the governance arrangement of Takutai Kāpiti to be deliberately structured to "co-design the project and community-led process" (Kāpiti Coast District Council, 2022, p. 2). An early strategic document, the TOR prescribed an inclusive and principled framework for coastal adaptation planning that reflects what Kamete (2011) described as a reorientation of planning practices, towards a model that is representative of inclusionary

planning and pastoral power. For instance the members of the Takutai Kāpiti Coastal Advisory Panel agreed to the following 'working together principles' outlined in the TOR (2022):

> *To be curious and contribute to the debate ... To listen and contribute generously and respectfully ... To trust the process ... To be open minded ... To make decisions by consensus ... To actively seek wider community feedback and input as part of the process.* (p. 4)

Fundamentally, the Coastal Advisory Panel's application of these principles is enhanced through the decision-making processes. For instance, the DMF (2022) highlighted the influential role of the advisory panel, as "the formal mechanisms through which wider community input and indigenous knowledge are used to develop a set of recommendations for coastal hazards adaptation for council's consideration" (p. 17).

Both the TOR and DMF documents prescribed an approach to coastal adaptation planning that is grounded in collaborative decision-making and characterised by the exercise of pastoral power (Kamete, 2011). This is important because coastal adaptation planning requires effective governance and the "reforming of power relations through public participation" (Elling, 2017, p. 236) to facilitate the integration of a diversity of perspectives and leverage anticipatory action, through community empowerment (Anderson, 2010; Metzger, Allmendinger, & Kornberger, 2021).

5.2.1 Empowering Communities Towards Coastal Adaptation

This section discusses governance and power by the facilitation of discussion, and process for negation, the hierarchy of decision making, and community empowerment in the context of the Takutai Kāpiti project. Community empowerment and the role of planners in fostering positive social structures for decision making in coastal adaptation was established in the literature review as essential for coastal adaptation planning.

Planners were described by Ericksen et al. (2003) as facilitators, with core functions in both the development and implementation of coastal adaptation planning initiatives The practice of planning was also presented by Beck (2006) as a form a rationalisation and negotiation, with planners often placed at the intersection of nodes of power and action, and across levels of governance and at the local community level. In Takutai Kāpiti, planners were tasked with the reconciliation of technical input, differing knowledge systems, community values and perceptions.

The Takutai Kāpiti project showcased the central role of planners in facilitating community input coastal adaptation planning. For example, planners were listed in the TOR (2021) as members of both the Technical Advisory Group (TAG) and the wider project team. The DMF (2022) illustrated the extent of planning input required to support delivery of the coastal adaptation project, see Figure 17 below. Roles included district planning and policy advisors, resource consent and compliance advisors and communications and engagement support.

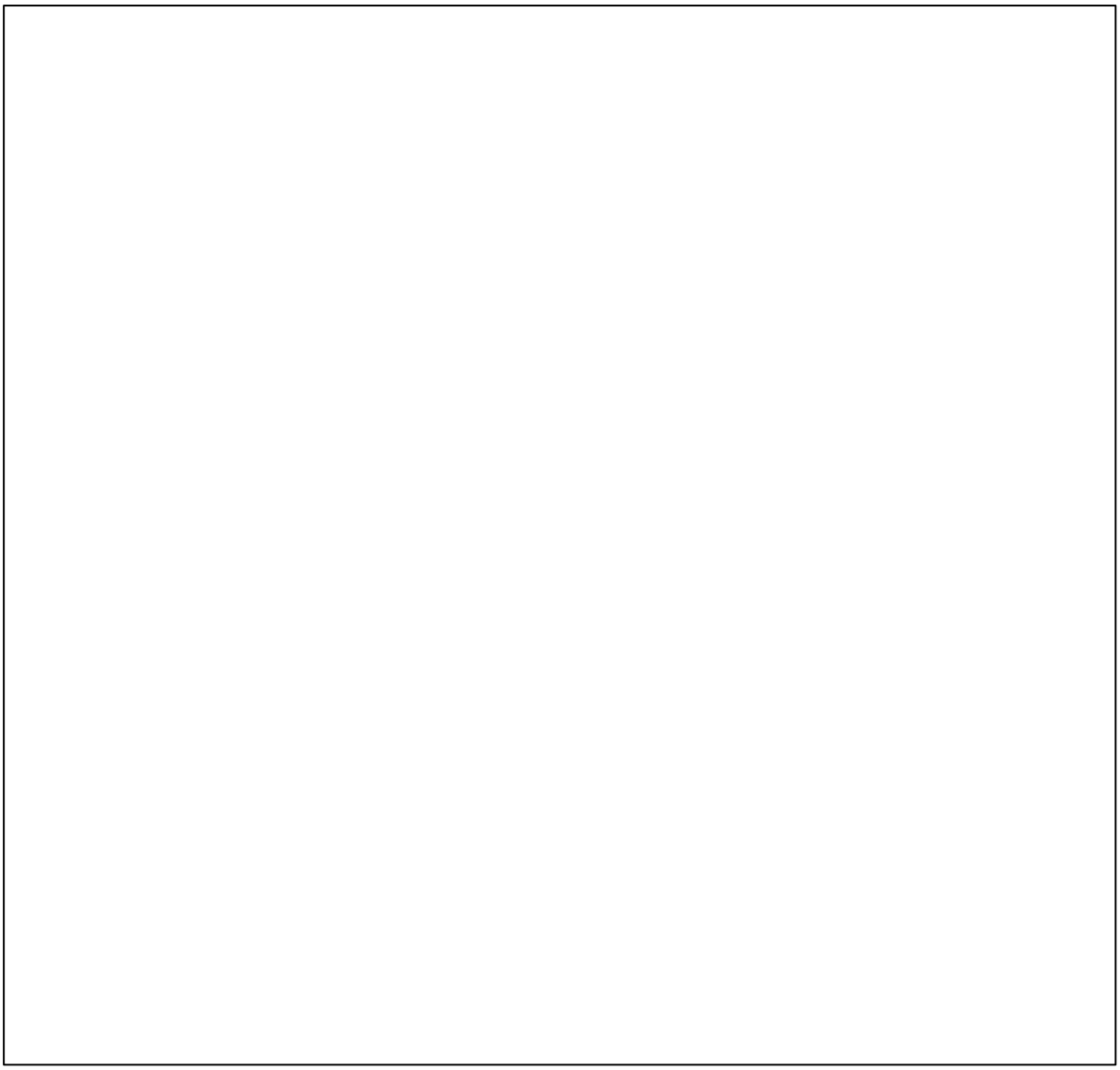

Figure 17: Members of the Takutai Kapiti Project Team (Source: DMF 2022, p. 14)

Fischer (2000) suggested that to ensure local input is integrated across decision-making processes, inclusive planning practices are useful tools to be applied across all stages of coastal adaptation planning. At the very beginning of the project, a Coastal Advisory Panel was formed, which had a communicative and participatory function in Takutai Kāpiti. The DMF (2022)

described the Coastal Advisory Panel as "the formal mechanisms through which wider community input and indigenous knowledge are used to develop a set of recommendations for coastal hazards adaptation for council's consideration*"* (p. 11). The advisory panel was promoted as a conduit for the community, advocating for local level participation in Takutai Kāpiti. The DMF (2022) set out the relationships and roles of the members of the project team and noted "the community representative group, is tasked with making recommendations to Council on behalf of the community … A consensus decision-making approach will be adopted". (p. 15). This research showed that Takutai Kāpiti project planners appeared to hold an influential role in the facilitation and legitimisation of coastal adaptation pathways for Takutai Kāpiti.

The need for a community-led and collaborative approach to coastal adaptation planning was highlighted early in Takutai Kāpiti project. This reflects that, in seeking a social license to proceed, policies are afforded legitimisation through local participation processes (Huxley, 2013). For instance, the TOR (2022) outlined key objectives "to determine, in consultation with the wider community, the preferred [adaptation pathway] option(s) and provide Council with recommendations" (p. 2). The TOR (2022) was identified as an influential document in Takutai Kāpiti because it established underlying principles to be embedded into decision making. For instance, reiterative expressions identified in the TOR (2022) included 'community-led', 'co-designed', 'preference for consensus' and 'social-license'. These adjectives also described the preferred methodological approaches to be applied across decision making for Takutai Kāpiti.

Kamete (2011) espoused the provision of reciprocal space and pastoral powers in planning practices. He stated it is important to provide opportunities for the public to engage and negotiate with those in a place of authority, and simultaneously, to afford authorities deeper insights into communities. For Takutai Kāpiti, facilitated collaborative workshops, both online and in person, were identified from the DMF (2022) as the key mechanism for achieving effective engagement and negotiation. To protect individuals from being attributed to contested views, the identities of those who engaged in these processes were anonymised. The DMF (2022) stated that "defining [coastal adaptation] objectives will be done in a collaborative workshop environment" and "recommended scores and rationale would be presented to the [Coastal Advisory Panel] in a workshop, and they will debate/confirm … and change where they felt was required" (p. 23-26). Records of the feedback were included in the Coastal Advisory Panel Engagement Summary reports. The analysis of this commentary provided

insights on the management and safeguarding of community input to inform decision making. It also highlighted how the community perceives coastal hazard risks and some of the things they value about the Kāpiti Coast coastal environment.

As the project progresses, more nuanced findings on coastal adaptation planning from the exercises which demonstrated genuine engagement with the community were observed. These included the workshops undertaken across the five adaptation areas: Northern Kāpiti (including Ōtaki, Te Horo, and Peka Peka), Central Kāpiti (Waikanae and Paraparaumu), Raumati, Paekākāriki, and Queen Elizabeth Park. In the Raumati Report (2023), the commentary from the community included: "the seawall provides protection and access for elderly / disables … our biggest recreation … erosion is a natural part of coastal living … planned not just reactive" (p. 8).

The information captured from these workshops offered deeper insights into the communities' current perceptions of risk, which leaned towards an appreciation for maintaining the status quo, including that this "may well mean much of low-lying Kāpiti should be left to revert to coastal wetlands" (RAA, 2023, p. 9). It also highlighted some of the attributes of value to the community of the Raumati Adaptation Area, including "people are the most important … walks on the beach at sunrise or sunset are dependent on the tides … views from our house and direct access to the beach" (RAA, 2023, p. 7-9). This is necessary, because as several scholarly authors have referred, how communities value their landscapes is intrinsically linked to their acceptance of efforts to adapt to climate change (Glavovic & Smith, 2014; Sesana, Gagnon, Ciantelli, Cassar, & Hughes, 2021).

Participation is necessitated in coastal adaptation planning. Fischer (2000) noted that gaining of public input through multiple means of participation can assist to resolve complex social, economic and environmental conflicts and tension. This view was reflected in the Takutai Kāpiti project, which provided examples of technical assessments where the transmission of knowledge and information on values and perceptions of risk was achieved through inclusive engagement practices. For instance, the EVR Report (2024), while approached to align with national policy, also noted that it:

> *proposes methods to gain an understanding of … community values … Outlining the importance of including these 'other' values ensures community values are considered in full … which in turn avoids risking community acceptance on decisions."* (p. 11)

The research highlighted the importance of community participation, its value was also highlighted in the literature as invaluable for coastal adaptation planning, for its potential to decipher and diffuse polarising matters before a point of cynicism is reached within a process of decision making (Friedmann, 2008; Tierney, 2014; Elling, 2017).

Overall, regarding the role of governance and power in coastal adaptation planning, this study reflected scholarly literature. In the case study, it was the communities' power to influence and constrain outcomes that elevated the responsibilities of the CAP, and more broadly, the responsibility of planners, in facilitating effective decision-making, across phases of coastal adaptation planning. The influential role of community empowerment and inclusionary practices, to legitimise coastal adaptation planning is illustrated in Figure 18 below.

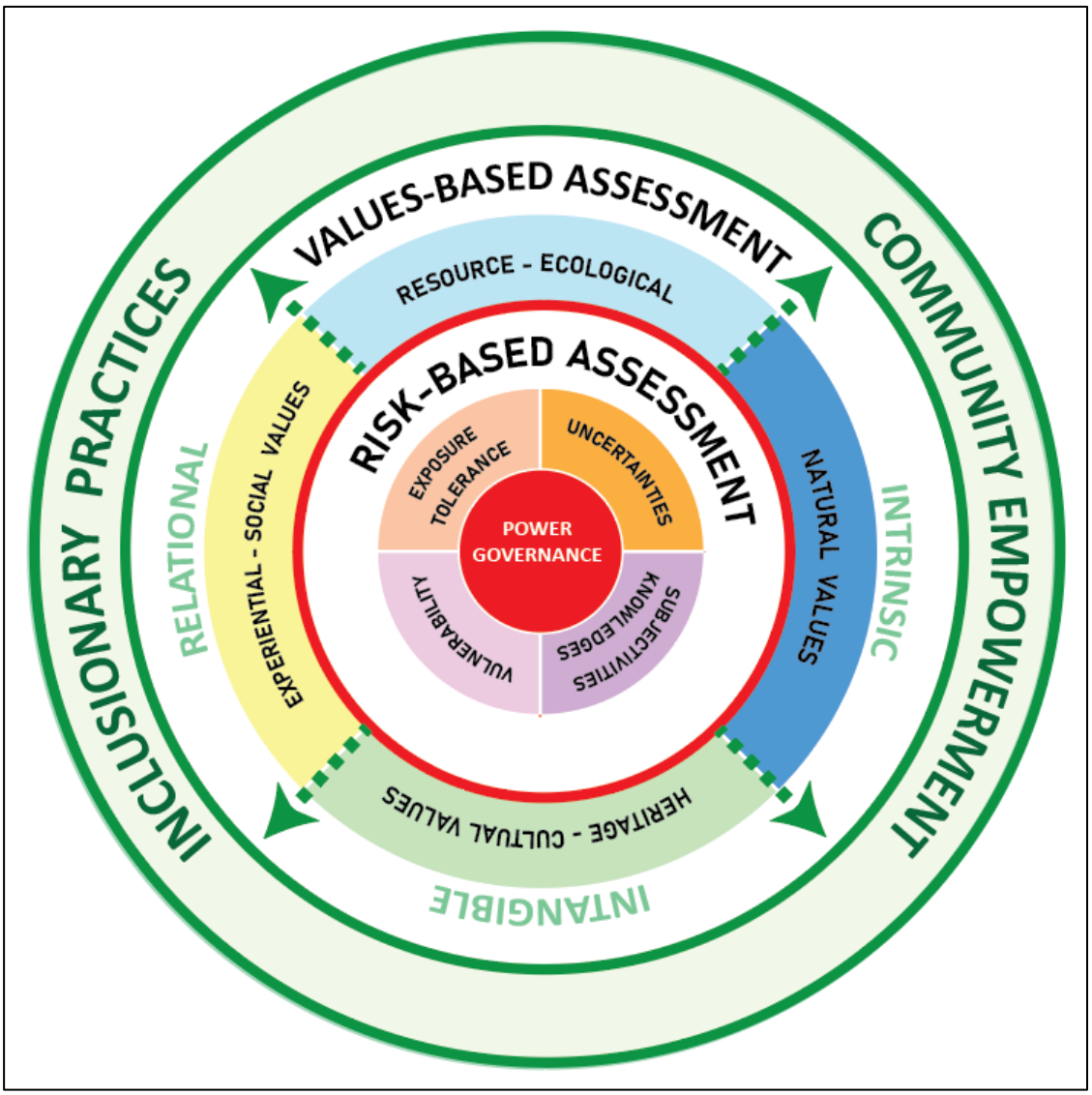

Figure 17: Concentric Framework for Coastal Adaptation Planning (Source: Author's own)

5.2.2 Facilitation and Negotiation

As established earlier, trans-disciplinary input is necessitated in coastal adaptation planning, across all levels of governance and most importantly, through locally affected communities (Concha-Homes & Oliver-Smith, 2019). Prior to the Takutai Kāpiti project the Council commissioned an independent review of the coastal provisions proposed in the unsuccessful plan change. In particular, the TOR (2022) reported "the hazard lines recommended … were not sufficiently robust to be incorporated" (pg. 8) and that the coastal hazard provisions should be reworked and "of sufficient scope so that the community could submit on the full range" (p. 10). The recommendations which were drawn from the review highlighted the significant power that communities hold in the legitimisation and the adoption of planning and policy mechanisms (Fischer, 2000; Elling, 2017). It also provides insights into the level of transdisciplinary input necessitated to provide a 'robust' level of information to inform coastal adaptation planning.

The Takutai Kāpiti Coastal Adaptation Project was a response to the 2012 plan change, which was, arguably, a top-down approach, with insufficient community engagement and narrowed expertise input; reinforcing arguments for more inclusive and deliberative approaches to coastal adaptation planning, as recommended by Lawrence et al. (2019). Informed by the review of the 2012 plan change provisions, the DMF (2022) recommended that experts were engaged "to provide technical support to the CAP … made up of a broader range of subject matter experts" (p.13). The supportive nature intended of the technical expertise is affirmed through a statement in the DMF (2022) that it "will adjust in accordance with the CAPs request for further information" (p.2). Although Beck (2006) suggested there was a hidden politics and a "morality of expert thinking" in the practice of risk assessment (p. 332), this case study demonstrated a shift away from these practices and presents an example of transparency and inclusionary practices in risk assessment.

Also established earlier was the role of planning, as a practice of negotiation and mediators of power (Forester, 1989; Flyvbjerg, 1998). In Takutai Kāpiti, planners are listed in the DMF as members of the Technical Advisory Group (TAG) and are required to facilitate dialogue and negotiation across stakeholders, including the community, iwi and local authorities. For example, key responsibilities of the TAG, outlined in the DMF (2022), included "preparing and facilitating the key information … and coordination and facilitation of CAP workshops to help develop final recommendations" (pg.13.). For Takutai Kāpiti, planners were not only involved in facilitating dialogue and negotiation with stakeholders, to inform the project, but the final recommendations of Takutai Kāpiti would also be used by planners to "help inform the broader

coastal strategy and a district plan change" (DMF (2022) p. 2); a process necessitating mediation with governing agencies including both the Greater Wellington Regional Council and the Kāpiti District Council.

In discussing the broader implications of adapting to climate change, Misiune et. al (2022) noted that "there are multiple independencies between people and nature that must be addressed simultaneously" and to do this adaptation planning requires "a transdisciplinary approach to bridge differences in perspectives and methodologies …" (p. 4). For Takutai Kāpiti, members of the project team were required to "use various assessments covering social, environmental, cultural, infrastructure, and economic impacts from coastal hazards to inform the selection of the recommended preferred pathways consisting of adaptation actions". (DMF 2022, p. 2). This exposed the role of planners, as facilitators and mediators of power and governance, planners were observed to hold a central function within coastal adaptation planning processes, as illustrated in within the Concentric Framework for Coastal Adaptation Planning. The case study showed that planners are required to bridge differences across technical disciplines, including qualitative value-based assessments and more quantitative assessments on risk assessment.

The DMF (2022) described the process of Takutai Kāpiti as a "consensus decision-making model" and "negotiation approach" (pg. 15). This reflected the inclusionary practices applied in the IPBES (2022) framework on the valuation of nature, as explored in section 2.4. The process of undertaking Takutai Kāpiti demonstrated that as both technical and social actors, planners were required to balance contesting epistemologies, power relations, and expectations, across all levels of governance and the community.

The arduous process and the extent of information required for the assessment of coastal hazard risks, as outlined in the TOR and DMF, also reflected the complexity of planning for adaptation in the context of changing landscapes, as referred by Scheller (2020). Analysis of these two documents revealed the expanse of information that planners assist to gather, interpret, balance and negotiate for use in coastal adaptation planning practices. It also highlighted the diversity of information available, both qualitative and quantitative, that can be used to inform the assessment of risk, for the purpose of developing pathways towards coastal adaptation.

5.2.3 Hierarchical Governance and Localised Decision-Making

In terms of hierarchical governance, the Takutai Kāpiti project emphasised statutory alignment with national guidance and collaborative decision-making. Specifically, to ensure alignment with "the 10-step decision cycle framework from Ministry for Environment (2017) Coastal

Hazards and Climate Change Guidance for Local Government" (DMF, 2022, pg. 2, refer Fig. 6), the project was deliberately structured to be carried out through a 'phased' approach; "split into three key phases" (pg. 16), each highlighted different dynamics of governance and power. For example, the phases are outlined in the DMF (2022) and include:

- *Coastal Advisory Panel [formed] who are tasked with developing a set of recommendations for how coastal communities ... should adapt to sea level rise. (p. 2)*
- *Defining and confirming; ...a series of tasks to help set the baseline criteria ... carried through for use across each Adaptation Area. (p. 16)*
- *Assessment of Pathways for Adaptation Area. ...develop the recommended adaptation pathways within each area ... based on values ... along with the experience and views of the CAP as community representatives. (p. 16)*
- *Synthesis and Final Recommendations. ...seek [community] feedback on their initial preferred pathways ... incorporated into the final preferred pathways presented*. (p. 17)

In the case of Takutai Kāpiti's Coastal Adaptation Project, differences in the application of national and local directives were identified, including standardised qualifications of value that were refined and applied in landscape assessments. Cooper and Pile (2014) said the use of objectively refined and standardised methods of valuation "can be the basis of considerable conflict" (p. 91). To avoid this, localised and contextually relevant approaches to risk and landscape assessment are required.

Methodological differences were evidenced within the text of two core landscape assessment documents: the Kāpiti Coast Natural Character Evaluation, 2024 (NCE) and the Ecological Values Review Report, 2024 (EVR). Both assessments relied on nationally standardised methodologies to quantify value, and contrast in how they dealt with intangible, intrinsic and relational values, compared to other approaches to landscape evaluation. These differences are explored further in section 5.4 of this chapter.

Analysis of the second phase of Takutai Kāpiti revealed inclusive practices and collaborative decision making across levels of governance and the community. This was enabled through the sharing of information and experiences between Council, as the governing body accountable for adopting the recommendations, other stakeholders, and the community (who also provided input into the recommendations). Phase 3 showcased the transition of power and governance

from a state of planning towards action. It is during this last phase that the significance of community empowerment and ongoing engagement were highlighted, as well as the accountability of governance. Fundamentally, the Council was tasked with overseeing the implementation of the recommended coastal adaptation strategies from Takutai Kāpiti, in accordance with national direction.

As noted in Chapter 2, decision making in the context of potentially differing perceptions of risk and value is complex. In outlining the processes undertaken during Takutai Kāpiti, the DMF (2022) described two "well-established" decision-making tools "that have been applied both nationally and internationally … to support application of the DAPP framework" (p. 2); these are: Multi-Criteria Decision Analysis (MCDA), and Real Options Analysis (ROA). The DMF (2022) described these techniques as "an aid to thinking and decision-making, but not to take the decision" (p. 8) and stated that they were to be used to "help provide analysis of different options and outcomes, and how they compare to one another" (p.8). In Takutai Kāpiti, MCDA and ROA are additional tools, used to translate the information gathered from phase 1, into a series of "recommendations for how coastal communities and infrastructure … should adapt" (DMF 2022, p 2). Essentially, Takutai Kāpiti applied a phased, inclusionary and broadly encompassing approach to the development of Dynamic Adaptive Planning Pathways (DAPP) that reflected the contemporary approach to coastal adaptation planning also prescribed by Rubooga (2024) (refer section 2.2.1). As noted above, effective governance is necessitated in the development of DAPP to bridge contested national and community expectations in coastal adaptation planning.

The detail provided in the DMF on the structure and the selection of decision-making techniques, including MCDA, ROA and DAPP, reflected a transparency of the pivotal notions of power and governance, that function in the practice of coastal adaptation planning. The selection of tools to assist decision-making were justified through their alignment with national guidance. Specifically, the DMF (2022) stated that "DAPP is recommended in the MfE (2017) Guidance" and that adoption of these techniques would be "in line with several other case studies in New Zealand" (pg. 4). The DMF (2022) also explained that DAPP "focuses on making transparent what the path dependency is between actions" (pg.4). This establishes that DAPP was selected as a means of translating factors of influence in decision-making, for coastal adaptation planning.

Analysis of the reasoning behind the selection of DAPP revealed an example of attempts to foster a positive framework of which to navigate decision making, across levels of governance. It also indicates an appreciation for legitimisation, both in terms of justification through national guidance, and case study experiences.

As strategic documents, the TOF (2022) and the DMF (2022) documents were structured in a manner that set the tone for the groundwork required in progressing through each phase of Takutai Kāpiti. They highlight the importance of the early scoping phase in coastal adaptation planning, not only to provide context, but also to set expectations, establish legitimacy and sustain momentum. For Takutai Kāpiti, governance was actioned by way of transparent and inclusive social structures, supported by critical resourcing and transdisciplinary expertise. Together, this content reflected Weinkle and Pielke's (2017) assertion that the assessment of risk "requires integration of objectives, norms, worldviews and political power" (p. 566). It also highlighted the critical role of planners, placed at the intersection of technocratic knowledge and democratic processes in coastal adaptation planning. As facilitators of dialogue and negotiation, planners function as mediators of power across levels of governance (Conacher, 2000; Friedmann, 2008; Elling, 2017; Metzger, Allmendinger, & Kornberger, 2021).

5.3 Risk Based Assessment to Inform Takutai Kāpiti

The second layer of rings in the Concentric Framework for Coastal Adaptation planning refers to factors of risk-based assessment in coastal adaptation planning. Risk is a determining factor when planning for coastal management and climate change. In the case of Takutai Kāpiti the differences were observed following the document analysis between the expert driven assessments of risk, and community informed perceptions of risk for Kāpiti. In the first instance, the Kāpiti Coast Coastal Hazards Susceptibility and Vulnerability Assessment (CHZSV) (2022) did not incorporate social, ecological or community values, explicitly noting "this assessment has not considered any social, ecological, or culturally significant assets, sites, or services, as this will require input from the community to understand what assets or sites the community values" (p. 42). As a result, the data presented in the susceptibility and vulnerability report is highly technical, focused on the "the spatial extent of areas potentially susceptible to current and future coastal erosion and inundation hazards." (CHZSV 2022, p. 6). This reflected the application of an exclusively technocratic approach in the first phase of Takutai Kāpiti, that does not necessarily capture the complexities of risk interpretation.

Chapter 2 established that traditional approaches to risk assessment, which rely on technocratic methods, can be useful in terms of setting a benchmark or baseline scenarios for quantifying change (Conacher, 2000; Kilvington & Saunders, 2019). For Takutai Kāpiti, coastal hazard 'risk' was primarily defined through objective hazard assessments. For instance, the Coastal Risk-Based Planning: Thresholds and Scenarios Report 2023 (TH-SC) stated that "to define appropriate erosion likelihoods for different coastal erosion risk categories for land-use planning, a combination of SLR scenario, timeframes and probability of occurrence needs to be considered" (p. 56). The TH-SC (2023) suggested that hazard risk overlays "should be based on technical hazard information" and applied "to define appropriate relative sea level rise (RSLR) scenarios and boundary thresholds between hazard levels or categories of risk" (p. 11).

The following sections explore the second grouping of rings in the Concentric Framework for Coastal Adaptation Planning (Figure 19). The look at risk-based assessment from four perspectives: exposure and tolerance, uncertainties, subjectivities and perceptions and vulnerability.

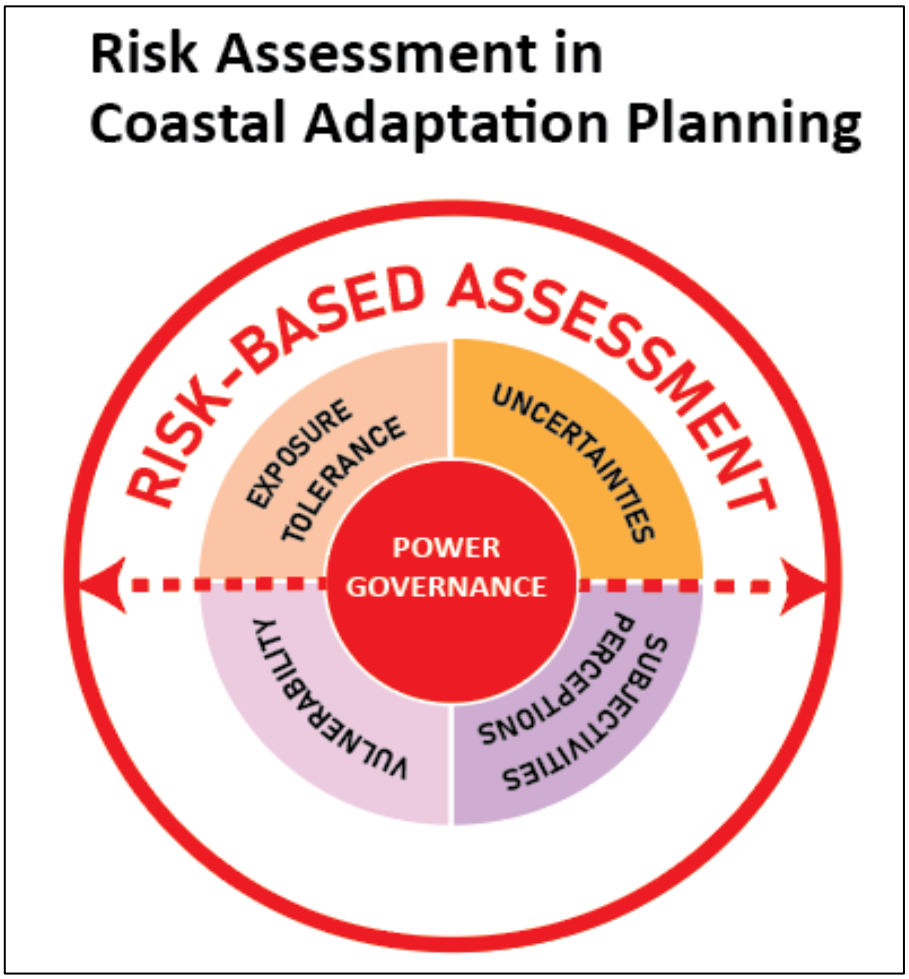

Figure 18: Factors of Risk-based assessment in coastal adaptation planning (Source: Author's own)

5.3.1 Exposure and Tolerance to Risk

Determining risk exposure and tolerances is complex. The tolerance to the impact of coastal hazard risks in the case study seemed overly cautious. For example, the TH-SC (2023) emphasised that the physical impacts of coastal hazards were always 'high', noting that "the key determination [of risk] is likelihood, as the consequence is always high, for example land is eroded and therefore will be unusable after a certain time" (p. 56). While this approach makes sense from a technical perspective, to build context in terms of physical risk exposure, it does not address the multitude of other external factors that can influence a community or individuals' vulnerability and tolerance to risk.

The complexity of limitations in risk assessment were made transparent in Takutai Kāpiti, including the recognition of other sources of uncertainty that can aggravate conviction. For instance, the Coastal Risk-Based Planning: Thresholds and Scenarios Report (2023) noted these include not only data limitations, but uncertainties associated with the longevity of existing structures and effectiveness of mitigation efforts including dune resilience proposals.

Produced during the third phase of Takutai Kāpiti, the SIA (2024) described "a sentiment amongst those interviewed that they enjoy things as they are along the coast" (26) and in a similar sentiment, the CVA (2023) noted that in the face of climate change "our Atua Māori are still going to reign havoc … there are an infinite number of possible future realities we can envisage, but that are yet to occur" (pg 105). The commentary captured in these two assessments reflected less caution and resistance towards coastal adaptation and an acceptance of the status quo. It also demonstrated how the interpretation and perception of risk can differ and that a community's tolerance of risk is also variable. This underscores the importance of facilitating community-led risk assessments to inform risk thresholds and empower anticipatory action in coastal adaptation planning.

5.3.2 Managing Uncertainties and Polarising Scenarios of Climate Change Risks

As identified in the Concentric Framework for Coastal Adaptation Planning, there are uncertainties that complicate risk assessment, including climate change predictions and how they affect scenarios of risk. Assessments of risk that are based on statistical uncertainty alongside qualifications of vulnerability to physical assets and social, cultural and environmental values are not easily quantified (Jacobs, 2023). However, once identified, sensitive activities can be deterred from being located in high-risk areas and the risks associated with current activities can be proactively managed (New Zealand Coastal Society, 2022).

As Lupton (1999) noted, "subjectiveness is an inevitable element of human judgement, … [and] therefore technical risk assessment is not value-free" (p. 28). The Concentric Framework for Coastal Adaptation planning highlights the significance of managing uncertainties and the relationship of uncertainty with perceptions and subjectivities of risk. It illustrates the influence of these factors on legitimisation and public acceptability when prescribing risk thresholds and triggers in coastal adaptation pathways.

5.3.3 Integrating Ways of Knowing and Subjectivities

As established, the Takutai Kāpiti coastal adaptation project endorsed a collaborative approach to risk assessment through the TOR and DMF documents. Chapter 2 showed that gathering information on community perceptions and expectations of risk, including from differing knowledge bases, is helpful to evoke anticipatory action towards climate adaptation (Anderson, 2010; Narayan, et al., 2020). It also highlighted that indigenous knowledge systems, such as Mātauranga Māori which can transmit historical trends and predicted futures in relation to the environment.

Mātauranga Māori in Takutai Kāpiti

Mātauranga Māori can be used alongside western techniques, to both inform and legitimise the use of particular climate change scenarios for application in risk assessment (Environmental Protection Authority: Te Mana Rahui Taiao, 2020; Mead, 2012). In Takutai Kāpiti, the transmission of historical trends and predicted futures, drawn from a Mātauranga Māori perspective, were reflected in the CVA (2023), which began with the following whakataukī' (proverbs):

> *Titoro whakamuri, kokiri whakamua – look back and reflect so that we can move forward whakatauki; … Whatungarongaro te tangata toitū te whenua – as people fade from view the land remains* (p.4).

The assessment required the "need to accept that there is a place for Mātauranga Māori and western science" in coastal adaptation planning and offered several tools to bridge the "perceived difference in Mātauranga Māori and western science" (109). These included the documentation and mapping of areas of cultural significance, alongside the facilitation of 'negotiated space', as illustrated in Figure 19 below. Negotiated space was prescribed in the CVA (2023) as an inclusive place for differing knowledge systems, described as a space where Mātauranga Māori and Western Science "both sit beside each other" (CVA 2023, p. 109).

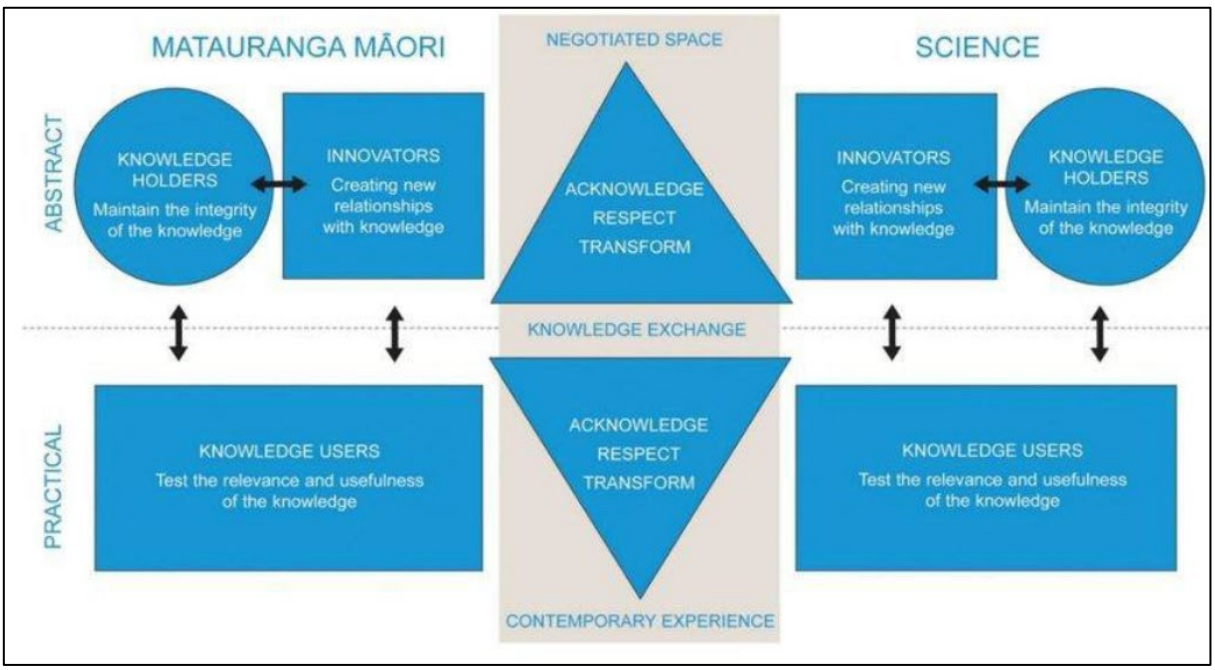

Figure 20: Negotiated Space Model (Source: CVA, 2023, pg. 109)

Another integrative participatory tool provided in the CVA (2023) included:

> *He Awa Whiria: A braided rivers approach ... acknowledging that each [knowledge system] has a place and that both systems can enhance outcomes, that they don't compete with each other but support, inform and create a new enhanced framework* (p. 110).

These tools were recommended by the CVA (2023) to be applied in Takutai Kāpiti, to provide a safe and inclusive opportunity to exchange knowledge "where ideas [and] values are explored, realigned, re-negotiated and agreement reached" (p. 109). This approach sought the creation of new relationship with knowledge, that also maintains the integrity of the knowledge systems and allows for the negotiation of differences, strengthening earlier discussions which espoused positive social structures and inclusionary practices for effective governance in coastal adaptation planning. The approach detailed in the CVA (2023) provides opportunities for the transition of power through the accommodation of knowledge, a space where action towards coastal adaptation planning may be driven.

Despite the extensive level of information provided in the CVA (2023), the analysis observed a lack of integration between the two primary knowledge systems: Mātauranga Māori and Western Science. This was particularly evident in the final report of the Takutai Kāpiti Coastal

Advisory Panel, described as "a substantive collation of information, consultation with the wider community and assessment of options relation to coastal adaptation plans" (Pg. 21). The Takutai Kāpiti Final Recommendations report does not include any explicit negotiation or integration between the CVA and other assessments. Instead, it presents a reductionist view, relying on the researcher to navigate cross-references to separate reports to understand how the full spectrum of information gathered was used, noting "a collection of other subject-matter reports prepared by a number of expert consultants … are attached as appendices" (Takutai Kāpiti Coastal Advisory Panel, 2024, p. 58). In terms of Te Tiriti o Wataingi (section 3.4), which mandates a partnership approach that incorporates Māori rights, values and knowledge into NZ planning frameworks, Takutai Kāpiti could be enhanced.

Notably, cultural values were only briefly reflected in the final recommendations report, where, after outlining the process of commissioning the CVA, it stated that the "key findings are reflected in the MCDA scoring process" (p.60). The development of the MCDA scoring criteria and risk matrix were also outlined within the summary documents for each of the defined adaptation areas in Takutai Kāpiti. The assessment of Te ao Māori values was included as a criterion in these processes, but the level of assessment for each area varied across the summary documents. In particular, the Northern Area Report (2023) included a risk matrix "of the elements assessed within the cultural domain, and what information was used to inform the assessment of risk" (p 56). In contrast the Raumati Area Report (2023) did not incorporate any assessment of Te ao Māori values, stating that "risk assessment for the Cultural domain in relation to coastal hazard is still to be undertaken with Mana Whenua" (p.216). There is no explanation in the documentation analyses as to why this assessment was never completed prior to the publishing of the final report.

This study found that input from mana whenua was seemingly required to be provided separately in Takutai Kāpiti, as opposed to the approaches required by the CVA where assessments could be debated and negotiated with Māori, integrating the assessments from other subject matter experts with Mātauranga Māori. The assessment of cultural values was treated as a parallel workstream, reflecting the persistent divide between the use of expert and other forms of knowledge, to inform planning practices to which several scholars referred (see: Pascual, et al. (2022) and Swaffield and Foster (2000)).

The literature review undertaken for this research also highlighted the significance of incorporating Mātauranga Māori and other knowledge systems into planning processes through

inclusive engagement practices (see: Matunga (2000) and Mead (2012)). This was also at the forefront of the CVA (2023) which stated:

> *continued positive actions to restore and enhance the mauri and mana within our district is of significant cultural value to mana whenua* (p. 103); and
>
> *the development of adaptation strategies moving forward in this district is recommended to acknowledge, respect, and include Mātauranga Māori alongside other knowledge systems to be for the benefit of people* (p. 106)

However, possibly because not all the localised cultural assessments were completed, there is no evidence of collaboration with other subject experts in developing the risk matrices. Because of this, there are limitations to the application of cultural values within the final recommendations report for Takutai Kāpiti.

While the Takutai Kāpiti Final Report (2024) briefly acknowledged the "sharing of Mātauranga to inform the Takutai Kāpiti project" (p. 41), the term 'Mauri' was not used and there were limited references made to Mātauranga Māori. For example, only two of the defined adaptation areas refer to concepts of Mātauranga Māori, these included: "protecting the mana of the coast" (CAA 2023, p.84) in the Central Adaptation Area and maintaining "food basket values (Mahinga Kai)" (NAA 2023, p.70), in the Northern Adaptation Area. These were included in the Takutai Kāpiti Final Report (2024) as 'objectives' for these areas, indicating that where raised, cultural values were broadly included.

The TKPCAP Final Report (2024) stated that these objectives formed "criteria - a principle, value or objective by which something can be judged or decided against" (p. 11). Essentially, this means that protecting the Mana of the coast and Mahinga Kai are a criterion, applied only to these areas, for which the final recommendations to Council are weighted against. The three other defined adaptation areas: Raumati, Paekākāriki, and Queen Elizabeth Park, did not include any references to concepts of Mātauranga Māori in their objectives, for reasons including the one noted above. This suggests that the integration of Mātauranga Māori was not comprehensive or may have been selectively applied.

For Takutai Kāpiti, cultural values were managed in a parallel workstream and applied independently to the risk matrices used to inform decision-making. Provision of negotiated space and the application of the braided rivers approach, as required by the CVA to integrate cultural values across the Takutai Kāpiti project, was not observed. By privileging the physical

impacts of risk, without raising the significance of cultural values across the project, the Mana of Mātauranga Māori is essentially diminished. This again reinforces the need for genuinely inclusive and collaborative practices in coastal adaptation planning, where opportunities are provided for negotiation and the bridging of differing knowledge systems, across all subject matter domains.

Subjectivities and Perceptions of Risk in Takutai Kāpiti

The literature showed that actions towards coastal adaptation that focus on risks in isolation can lead to skewed prioritizations in the development of adaptation pathways (Griggs, 2005; Kisacik, Ozyurt Tarakcioglu, & Cappietti, 2022). This is also illustrated by the second series of rings in the Concentric Framework for Coastal Adaptation Planning, where four subsections of risk assessment are identified. The probability of rising tensions in the management of landscape change was noted by Scheller (2020), whilst Tierney (2014) highlighted the potential for cynicism when approaches to risk assessment do not align with community perceptions or expectations. This study identified areas for improvement in the integration of not only cultural values, but also wider community input into risk assessments.

The study observed that, for Takutai Kāpiti, the first phase of the project prioritised technocratic expertise over community input and focused on the physical impacts of coastal hazard risks, in isolation (Section 5.3.1). For example, the first phase is described in the DMF (2022) as being a series of 'technical tasks' involving, "defining adaptation areas … confirming the MCDA criteria [and] confirming the 'long-list' of adaptation options" (p.16). The purpose of developing the MCDA criteria was, according to DMF (2022), "to score each of the shortlisted adaptation pathways" (p. 14). The DMF required that, in developing the criteria, the advisory panel "did not start with a blank sheet" (p.14). While this approach is pragmatic in terms of providing a baseline of information, the privileging of expert knowledge, by limiting community input, is viewed objectively by Lupton (1999) and (Rulleau & Rey-Valette, 2017).

For Takutai Kāpiti, a range of technical subject matter assessments were commissioned as part of phase two (refer table 2, section 4.5.1). The study observed that, aside from community input into the SIA and CVA, the technical assessments on risk and landscape values lacked any direct community engagement. For instance, the NCE (2024) stated:

> *... no community engagement or consultation has been undertaken in this phase of the project. Experiential characteristics and values are therefore those determined by the study team.* (p. 95)

The ECO (2024) also relied on "information that was publicly available at the time" (p. 33), including "ecological Sites within the Kāpiti Coast District … including through community feedback" (p. 20). There were no references to any specific community engagement on the impacts of coastal hazards on ecology. Notwithstanding, the ECO (2024) recognised the disadvantages of this approach and stated that "things change and will need to be verified through subsequent methods" (p. 11). This suggests that more opportunities could have been made, and perhaps were outside of the suite for documents analysed for this study, to verify the findings of the ECO as part of Takutai Kāpiti. This could have included earlier and more topical, localised community engagement to inform technical assessments. Affirming the literature of Huxley (2013) and Rubooga (2024) who noted that early, inclusive and comprehensive public participation affords legitimisation and validates coastal adaptation planning outcomes.

Compounding the lack of specific community input, separate engagement processes were carried out during phase three, where the questions posed to participants were framed around the broad topic of coastal hazards. For instance, the Raumati Report (2023) stated "four questions were used to prompt discussion with the community on how they value their coastline, the perception of the risk related to coastal hazards (inundation and erosion), and thoughts on potential coastal adaptation responses now and over the next 100 years." (p. 4). The questions in RAA (2023) included:

- What do you value most about living here?
- How important is our coastline to you?
- How concerned are you about coastal hazards like erosion and flooding, and why?
- How do you think our coastline should be protected?

The responses were collated across themes and subthemes. While the process of this is not detailed, based on the numbering and distribution of responses across the themes and sub-themes, it appears each individual response was attributed to a singular theme or sub-theme. However, many of the responses encompassed multiple themes and subthemes, and if they are prioritised against only one theme, there will be a risk of skewed prioritisation of objectives. For example, one respondent in the RAA Summary Report (2024) said they valued "Less

congestion. Less population. Quieter pace. Seeing and hearing bird life. Having access to beach by foot and vehicle." (p. 22). This response covered a range of attributes, including natural character, ecology and social opportunities. By prioritising one primary theme, such as 'natural environment' or 'recreation', the significance of the other matters of value be reduced. This warrants further research but is outside the scope of this study.

Fundamentally, the qualitative information gathered from the community and mana whenua during phase two was not observed to have been directly considered against, or integrated into, the findings of the varying technical assessments of phase one, before being used to develop criteria towards preferred adaptation pathways. It is noted however, that the Takutai Kāpiti Final Report (2024) acknowledged there is still work to be done in determining specific community signals, triggers and thresholds, stating, "we recognise that consultation with the community to determine thresholds and the associated signals and triggers is essential" (p. 113). This may be one such area where further work is required to integrate and align the identified preferred adaptation pathways with the information gathered from the community and mana whenua on specific values of nature and culture.

The literature showed that early, comprehensive and ongoing engagement can assist with legitimisation and community buy-in towards coastal adaptation (Cooper & Pile, 2014; O'Donnell, 2022; Rubooga, 2024). This document analysis highlights the necessity to 'make space' within decision making frameworks, for integrating diverse forms of knowledge, including lay perceptions of risk and indigenous world views, alongside technical expertise. This approach would enable a more holistic and inclusive comprehension of localised concerns.

Again, the pivotal role of planners, as facilitators and information conduits across decision making processes is underscored through the analysis of the approach to risk assessment for Takutai Kāpiti. Planners are required to gather, interpret and balance technical data and lay persons input to inform risk assessment in coastal adaptation planning. A key insight from the Takutai Kāpiti Coastal Adaptation Project is that the validation of risk assessment is facilitated through inclusive engagement practices and by integrating contributions from across disciplines and knowledges, and planners have a core function to enable this.

5.3.4 Addressing Vulnerabilities in Takutai Kāpiti

The final factor of risk assessment in the Concentric Framework for Coastal Adaptation is vulnerabilities. The literature showed that risk is "a socially constructed phenomenon" (Lupton,

1999), and risk assessment should not be limited to the production of probabilities of occurrence and the physical scope and scale of harm.

As explored above, some of the technical assessments for Takutai Kāpiti, such as the SIA (2024) and the CVA (2023) offered more nuanced insights on risk from the perception of the community. For example, the SIA (2024) noted that:

> *attitudes towards the risk of coastal hazards were tightly linked to the risks posed to their livelihood or own property, and to Council rates and funding availability for coastal protection.* (p. 30.)

The Takutai Kāpiti project adopted a consensus driven approach. As noted in the DMF (2022), this involved a series of community workshops. Efficient negotiation was enabled through the engenderment of reasoning; a participatory engagement technique advocated by Elling (2017) in seeking preferred consensus in planning.

To address vulnerabilities in Takutai Kāpiti, land use controls were suggested as an appropriate response, having both an immediate and subsequent or future effect in reducing risk. Potential land use controls would match the degree of risk from hazards. The DMF (2022) stated that a key determinant of coastal risk thresholds and triggers was the likelihood and consequence of risk. The Kāpiti Coast Coastal Hazards Susceptibility and Vulnerability Assessment (2022) included a definition of 'sensitive activities' covering residential, retirement, medical and education facilities that maintain "potentially high risks to life and/or property" (p. 15). Vulnerable areas were identified to assist in the prioritization and timing of adaptation responses.

Regarding risk assessment for coastal hazard management, the research also showed that inappropriate planning practices can result in the exclusivity of knowledge and participation (Thomas, Phillips, Lovekamp, & Fothergill, 2013). Section 5.3.3 highlighted a reductionist approach to risk assessment that simplified cultural values and limits their application. Furthermore, a narrow set of values was observed to be prioritised in the final report when referring to the physical impacts of coastal hazard risks across the district. A key insight of this study is that the assessment of risk in coastal adaptation planning requires the consideration of more than just physical attributes of risk, it also requires the consideration of exposure, tolerances, uncertainty, perceptions and subjectivities and vulnerabilities.

5.4 Value-Based Risk Assessment in Takutai Kāpiti

The third nesting of rings in the Concentric Framework for Coastal Adaptation Planning (Figure 21) reflects the specific values of nature underpinning values-based risk assessment in coastal adaptation planning. As highlighted earlier, values-based approaches to risk assessment are a growing field, in the practice of planning (Pascual, et al., 2022). The coastal adaptation planning literature showed that a thorough understanding of landscape assessment methodologies is necessary. This is because the perceptions of our environment and the values assigned to it are strongly influenced by cultural background, aesthetic traditions and an individual or communal sense of connection and identity (McHarg & Steiner, 2006).

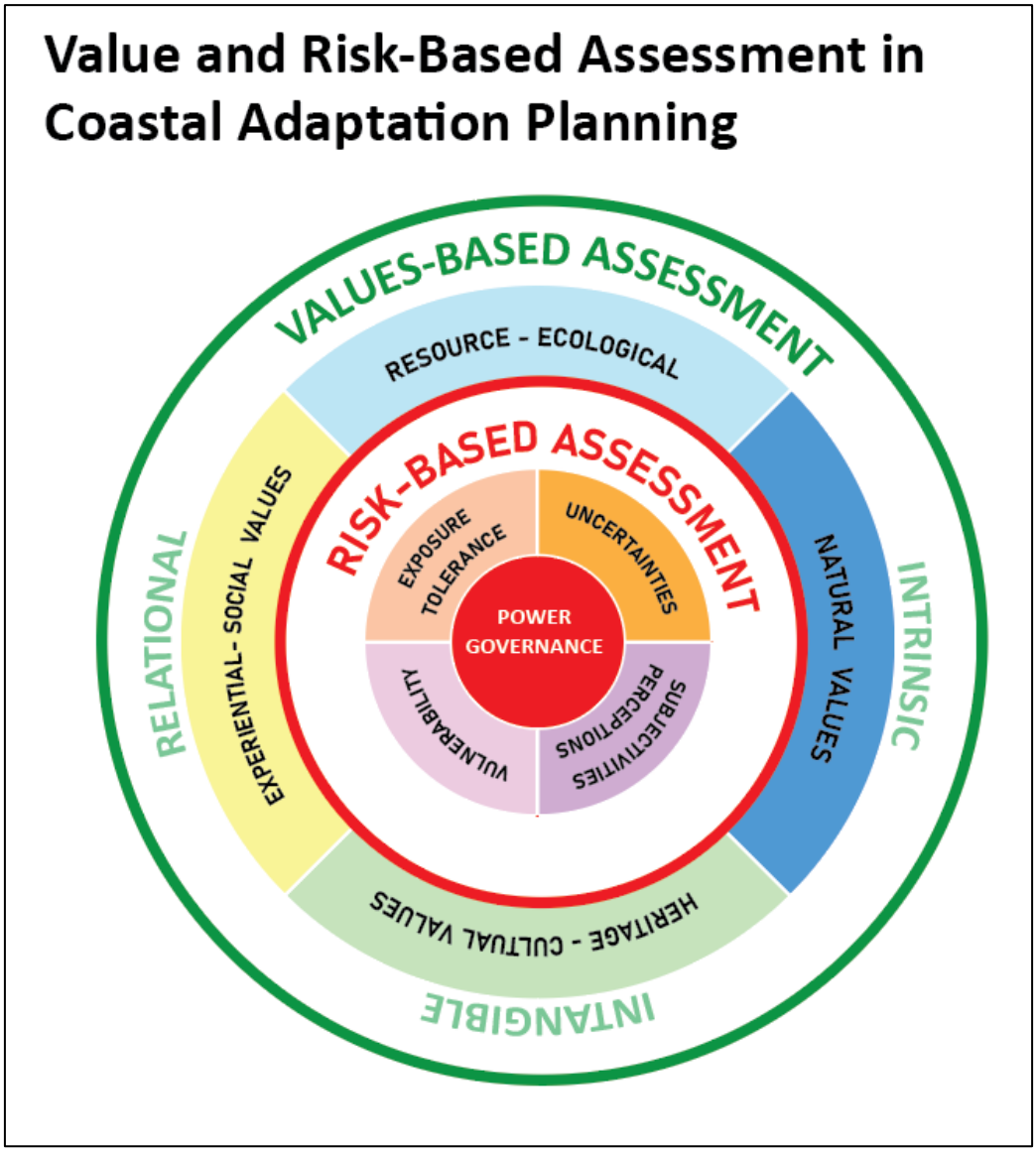

Figure 19: Value and risk-based assessment in coastal adaptation planning (Source: Author's own)

As Cassatella and Peano (2011) noted, landscape is grounded on the concept of perception and value, being "the result of the action and interaction of natural and human factors" (p. 3). For Takutai Kāpiti, the TOR (2021) required that the outputs of the project consider "the practicality, affordability, scientific, cultural, and social values (technical expertise provided externally) of a range of options" (p. 2), exposing the wide breadth of information, including information on values, that is required to inform decisions on coastal adaptation pathways.

The previous section, which explored risk-based assessment, highlighted the significance of integrating differing knowledge systems, including qualitative insights, into technical reports on risk assessment. The literature also identified that participatory and inclusive practices are key to the gathering, deciphering and conveyance of relational, intangible and intrinsic values attributed to landscapes (Abeysinghe, et al., 2014; Borrie & Armatas, 2022). The incorporation of values is emphasised in Takutai Kāpiti through the DMF (2022) which required those participating in the process to "turn what was learned about hazards susceptibility and social/cultural values … into a set of recommendations for coastal hazards adaptation..." (p. 3). This section explores values-based assessments and how these were approached in the case study to inform the final recommendations report of the Takutai Kāpiti Coastal Advisory Panel.

For Takutai Kāpiti, the intent of layering multiple assessment of value to inform risk assessment, is an example of the shift in coastal adaptation planning practices towards more holistic and inclusive practices. This section of the research discussion explored how qualitative value-based assessments were approached in the Takutai Kāpiti project. It highlighted the value of gathering qualitative data on intangible, relational and intrinsic values, and provided insights on how value-based assessments enhance the relevance and depth of information used to inform risk assessments for coastal adaptation planning.

5.4.1 Value-Based Assessments in Takutai Kāpiti

The first node of value to be considered relating to value-based assessment in the Concentric Framework for Coastal Adaptation Planning are intrinsic natural values. A key finding from the document analysis was that the Takutai Kāpiti Coastal Adaptation Project made early efforts to embed core principles of inclusivity and collaboration into the decision-making framework. Despite this, document analysis of the suite of documents of values-based assessments for Takutai Kāpiti exposed inconsistencies in the application of these principles across assessments, by the time of the final report. For instance, the NCE (2024) used methodologies

that diverged from the principled, consensus driven model outlined in the TOR and DMF documents. The NCE (2024) stated that:

> *no community engagement or consultation has been undertaken in this phase of the project. Experiential characteristics and values are therefore those determined by the study team.* (p. 95)

Furthermore, the assessment was not explicitly grounded in the context of coastal adaptation planning; while the NCE (2024) was published to align with the timing of Takutai Kāpiti, undertaking of the assessment was carried out for a different purpose. The NCE (2024) stated that it was developed to "give effect to the requirements in the Wellington Regional Policy Statement (RPS) and the New Zealand Coastal Policy Statement." (p. 2) and that the report contained "the preliminary results of the study, which the respective regional and district councils will review as part of the policy development of their resource management documents" (6). The NCE (2024) also stated that "since the completion … no adjustments to natural character ratings were identified in the context of the Kāpiti Coast District. (p. 6). The findings showed that the core principles underpinning decision making for Takutai Kāpiti were not applied in the assessment of natural character, indicating that the NCE could have been reviewed for use in specific planning purposes, such as Takutai Kāpiti.

From the document analysis, the ECO, CVA and SIA were identified examples of value-based assessments that corresponded with the principled and consensus driven objectives underpinning Takutai Kāpiti. For example, the SIA (2024) stated its purpose was to "build an understanding of the values and concerns of the community and facilitate a decision-making process that incorporates local knowledge (4). Similarly, the EVRR (2024) stated the purpose of its assessment was "to *understand* what 'things or objects' of value could be affected by increasing coastal hazards" (p. 11).

The case study analysis showed the principled approach prescribed in the TOR and DMF was applied to some of the technical assessments, including the social, ecological and cultural values assessments, but inconsistencies were identified with other reports, including the NCE, for which learnings can be applied.

5.4.2 Reconciling Landscape Values in Takutai Kāpiti

The analysis of the qualitative assessments undertaken to inform risk assessment for the Takutai Kāpiti reflected the relational and intrinsic dynamics of landscape value, as signaled in the Concentric Framework for Coastal Adaptation Planning. It also highlighted the complexity of reconciling landscape values in practice. Specifically, the case study analysis found difficulties in the defining of natural character, a term predisposed to subjectivities (refer section 2.2.6). The methodology applied in the NCE (2024) treated the evaluation of natural character as an objective fact or truth - simplified and able to be predetermined. Consistent with the literature, the case study showed the complexities of evaluating natural character, through attempts to reconcile experiential values against natural attributes in the NCE (2024). The NCE (2024) stated:

> *The shared and recognised aspects of available recreation infrastructure and activities are generally factored into landscape assessments as a positive contributor, but this may form a detractor in terms of an assessment of natural character.* (p. 95)

The SIA (2024) also acknowledged that many insights from the assessment "are qualitative in nature" and that this "empirical data could be enhanced in the future" (p. 49). The SIA (2024) suggested this could be done through:

> *A need to enhance information provision to communities regarding the status of coastal hazards …*
>
> *empirical evidence such as changes in insurance costs, property values, economic costs of flooding …*
>
> *a longitudinal community survey could be considered to monitor community perception and views, including with a view to values and behaviour. (p. 50 -51)*

Recognising there is a need for more information on values and behaviours supports the nature of this research, to provide insights into the practice of interpreting and deciphering specific values of nature to inform risk assessment. Specifically, this research considered the assessment of relational, intrinsic and intangible notions of value attributed to coastal communities.

As identified previously, the NCE (2024) demonstrated a reliance on technocratic data, over subjective qualifications. The use of a refined or restricted set of values in landscape assessment was cautioned in the report of the IPBES (Pascual, et al., 2022). IPBES (2022) suggested this approach could lead to subjective qualifications and hierarchies being assigned to some values, at the expense of others.

For Takutai Kāpiti, the analysis showed that the NCE (2024) applied technical weighting which downplayed experiential values, prioritising abiotic and biotic features across both marine and terrestrial areas. However, spatially, there is a greater extent of abiotic and biotic attributes found in marine environments, and because of the weighting exercise, terrestrial areas were observed to have lower qualifications of natural character overall, as illustrated in Figure 22.

Figure 20: Summary of Natural Character Value in RAA (Source: NCE 2024, p. 58)

The analysis of the NCE (2024) also observed that experiential characteristics were qualified by "opportunities to experience wilderness, isolation and remoteness" (p.50). The NCE (2024) defined 'High' experiential values as having opportunities for:

- *High natural experience*
- *Predominantly wild and remote*
- *Limited modification*
- *Clear experience of the sensory aspects of the coastal environment* (p. 98)

By assigning subjective degrees of 'opportunity to experience' as criteria, in the evaluation of natural character, without community input in this process, the determination of experiential

values is reduced to one that is narrow and subjective. The analysis showed that by prioritising abiotic and biotic components, and excluding community input on experiential values, the findings of the NCE (2024) presented a narrowed assessment of natural character. The document analysis also revealed a misalignment in the broad scaling and categorisation of natural character value overall, when considered against local, affected-community perspectives observed in the community summary reports. For example, in the RAA Summary Report (2023), a range of experiential characteristics of the coastal environment were identified, including "the lifestyle … connection of land and sea … provides an array of recreation … the features that drew us to build and move here" (p. 7)

Additionally, impacts on social, recreational and lifestyle values were raised in the SIA (2024), it was noted a key concern of community was the "loss of sites of value and amenities as foundations for community identity, cohesion and growth." (p. 49). Both the RAA Summary Report and the SIA emphasised the significance of experiential landscape values, from the perspective of the community of Raumati. The commentary from the community on experiential values of the terrestrial area for Raumati presented distinctively from the findings of the NCE (2024) which rated natural character in the Raumati area as 'low-moderate' overall, despite experiential values rating higher than both abiotic and biotic features. The shortcomings identified in the approach to the evaluation of natural character could arise as public contention and resistance to coastal adaptation. However, this cannot be validated without further analysis into the implementation of the adopted adaptation pathways.

The literature review (Chapter 2) showed that to efficiently and effectively promote public acceptance of planning initiative, inclusionary practices and the transparency of considerations of value are necessary (Elling, 2017). The analysis observed inconsistencies in the application of the principled and consensus driven approach prescribed in the TOR and DMF in the assessment of landscape values, as explained in the previous section. These shortcomings underscore the need for more inclusive and comprehensive approaches to landscape assessment for coastal adaptation planning. This becomes evident when reflecting on earlier findings on governance and power, which highlighted the central role of planners as mediators at the intersection of policy and community interests. By fostering positive social structures across all stages of coastal adaptation planning, from landscape assessment to decision making and enabling participatory planning practices, it is possible to develop more balanced and representative assessments of risk that genuinely reflect the diverse perspectives and intrinsic values of affected communities.

Applying value-based risk assessment in DAPP in Takutai Kāpiti

The literature highlighted the shift in risk assessment practices in natural hazard management and planning. Climate change was described in as a 'wicked problem'; a complex and contentious social and physical issue that is not easily understood, nor able to be "solved", but rather, "only re-solved over and over" (Rittel & Webber, 1973, p. 160). The literature review showed there are a multitude of external factors including individual subjectivities and perception, systematic bias and social vulnerabilities, which can influence the determination of risk exposure, tolerance and thresholds in coastal adaptation planning (Weinkle & Pielke, 2017; Glavovic & Smith, 2014).

In Takutai Kāpiti the relationship that individual subjectivity, perception, and social vulnerabilities can have on the determination of risk tolerance thresholds was observed. As Weinkle and Pielke (2017) noted, value-based risk assessment requires the integration of multiple "objectives, norms, worldviews and political power" (p. 566). The DMF (2022) stated that "The DAPP approach allows for making decisions in the coastal context where there are dynamic characteristics leading to ever-changing risk profiles*"* (p. 10). The application of DAPP in the study demonstrated an acknowledgement of the dynamics at interplay in coastal adaptation planning. The DMF (2022) also stated that "in developing a set of coastal hazard adaptation recommendations, several decision-making tools will be used to inform a DAPP" (p. 10). A multifaceted and trans-disciplinary approach is necessitated, and this is subsequently facilitated by the DMF (2022) which noted:

> *A decision-making framework (this report) is required to turn what was learned about hazards susceptibility and social/cultural values … into a set of recommendations for coastal hazards adaptation for the district coastline …* (p. 3)

The Terms of Reference (TOR) and the Decision-Making Framework (DMF) were identified as being influential documents in the facilitation of coastal adaptation in the Takutai Kāpiti Coastal Adaptation Project. The earlier analysis demonstrated that these two documents set the tone for the deciphering and addressing of subjectivities of risk and value.

The DMF (2022) also stated that the core objectives were to "develop coastal hazard response options through consideration of the practicality, affordability, scientific, cultural, and social values (technical expertise provided externally) of a range of options, based upon agreed trigger points" (p. 11). A multitude of external factors of risk assessment were identified in the DMF

and these are defined as 'Signals', 'Triggers' and 'Thresholds'. The DMF (2022) stated that "the CAP will be tasked to identify these signals, triggers, and thresholds…. It is important for transparency that CAP can communicate what changes … would trigger a change in adaptation action*"* (p. 31). The DMF (2022) further explained that "the adaptation threshold is … derived using the scenarios in the DAPP processes tolerance for the hazard has been exceeded" (p. 32) and highlighted that "some conflict or trade-off is usually evident amongst … objectives" (p. 8).

The application of DAPP in Takutai Kāpiti showed that it is necessary to consider a diversity of other factors. The TOR and DMF documents are fundamental because they not only prescribe DAPP and a principled approach to coastal adaptation, but they also prepare decision makers for the prospect of contention. DAPP is useful, it acknowledges uncertainty and adds a layer of plurality in terms of potential avenues to take in coastal adaptation planning. However, DAPP does not consider issues of power and governance; this is influenced and facilitated by the actors participating within the process, including local authorities, planners, iwi representatives and the community.

5.5 Summary

This chapter discussed the thematic analysis of the case study - Takutai Kāpiti, applying the Concentric Framework for Coastal Adaptation Planning to explore the relationship and power and governance and value-based risk assessment in coastal adaptation planning. The Kāpiti Coast District Council's Coastal Adaptation Project: Takutai Kāpiti generally aligned with contemporary planning practices that elicit the same core principles of inclusivity, collaboration, transparency. The project incorporates a broad range of value typologies into the assessment of risk that correspond with the Concentric Framework for Coastal Adaptation Planning developed from Chapter 2.

While there were some discrepancies or misalignment in the undertaking of some evaluations in Takutai Kāpiti, this could be enhanced with localised assessments that are contextually appropriate and integrate community input, specifically for NZ, this includes Mātauranga Māori. Notwithstanding, the underlying philosophy and overall approach to undertaking the community-led Takutai Kāpiti Coastal Adaptation Project was observed to align with the contemporary discourse on coastal adaptation planning. With more comprehensive and integrated assessments, Takutai Kāpiti could be regarded as a contemporary representation of best practice in coastal adaptation planning.

Chapter 6
Concluding Remarks

6.1 Introduction

This research has underscored the importance of integrating both risk-based and value-based assessments into coastal adaptation planning. Findings from the literature reviewed underscored the increasing concerns, both globally and in NZ, for exacerbating coastal hazards, noting that the effects of climate change vary for every location (Abeysinghe, et al., 2014; Begum, et al., 2022). NZ's geographical location means the country is subjected to prevailing westerly winds and the climatic effects of multiple ocean current systems (NIWA, 2021). The long-term effects of climate change and the immediate impact of severe weather events can alter the attributes of our landscapes, which are valued for a multitude of reasons (Pascual, et al., 2022).

This research explored a contemporary approach to risk assessment and landscape evaluation in coastal adaptation planning. Drawing on international scholarly literature, and the policy-making experience of the Takutai Kāpiti Coastal Adaptation Project in Kāpiti Coast, this research compared practice with conceptual frameworks, specifically, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) framework on value-based assessment.

Chapter 1 set the scene for coastal adaptation planning in NZ, finding that in small island nations like NZ, coastal communities are the first and most noticeable areas to experience the physical effects of climate change (Hayward, 2008). From the literature reviewed, it revealed that while NZ is considered to have significant adaptative capacity and capability at a national scale, key barriers to implementation at the regional and local level include considerable economic and sector bias constraints (IPCC, 2023). From this review of the literature, the Concentric Framework for Coastal Adaptation Planning was developed, an applied, using the Takutai Kāpiti Coastal Adaptation Project as a case study.

This study found that DAPP appeared to be a useful tool in coastal adaptation planning. As Abeysinghe, et al. (2014) suggested, it presents a collective mix of potential pathways and actions towards coastal adaptation. Takutai Kāpiti involved a phased, inclusionary and broadly encompassing approach to the development of DAPP. It was reflective of the contemporary approach to coastal adaptation planning provided by Rubooga (2024), as Takutai Kāpiti applies a multidimensional approach to coastal adaptation planning that seeks to integrate local

knowledge, cultural values and community priorities. Analysis of the decision-making framework and the application of DAPP in Takutai Kāpiti revealed an example of attempts to foster a positive framework, of which to navigate-decision making, across levels of governance. This was evidenced by the formation of a Coastal Advisory Panel, of which the faciliatory role of planners was also highlight. It also revealed an appreciation for legitimisation, both in terms of justification through national guidance, and through community experiences, again as evidenced by the analysis of approaches to landscape and risk assessment in the case study.

This study also corroborated that adapting to coastal hazard risks is a wicked problem (Rittel & Webber, 1973). In the case of Takutai Kāpiti, a balance had to be sought between maintaining the status quo and moving towards adaptation. But as the IPCC (2012) have noted, achieving a balance in determining risk thresholds and triggers requires planners to facilitate transdisciplinary approaches that bridge differing knowledge systems and subjectivities of risk and value. At the same time, acknowledging the influence of past, present, and uncertain futures in decision making.

This research was designed to draw insights from the Kāpiti Coast District Council's Takutai Kāpiti Coastal Adaptation Project about addressing landscape valuation and risk assessment, as they compared with the IPBES (2022) conceptual framework, in climate adaptation planning. The objectives of the research were to explore how risk and landscape values are expressed through documented assessments and used to inform Takutai Kāpiti Coastal Adaptation Project planning processes and outcomes, and to provide insights into the deciphering and interpretation of risk and landscape values to inform coastal adaptation planning.

6.2 Key Insights from Takutai Kāpiti Coastal Adaptation Project

The findings in Chapter 5 were structured around four inter-related concepts, drawn from the literature review these were: governance and power, risk assessment, values-based assessment and community empowerment, alongside considerations of global and local action. The findings of the case study analysis highlighted the multifaced challenges posed by climate change and the necessity for a transdisciplinary approach to coastal adaptation planning that bridges differences in perceptions of risk and value.

The literature showed that there has been a shift in awareness of the influential relationship that individual subjectivity, knowledge systems, and social vulnerabilities can have on the determination of risk tolerance thresholds (Weinkle & Pielke, 2017; Glavovic & Smith, 2014). It highlighted the need for greater consideration of intrinsic, intangible and relational values in

risk assessment. In the case of Takutai Kāpiti, the integration of cultural values and the determination of natural character were identified as areas that could be enhanced. The complexities of addressing climate change within an evolving political landscape were also revealed in the examination of the proposed plan change, which provided insights on the complications encountered. The course of Takutai Kāpiti demonstrated the susceptibility of planning to politics and highlighted the need for planning approaches to coastal adaptation that are politically responsive.

Takutai Kāpiti applied an approach to coastal adaptation planning that was grounded in collaborative decision-making and characterised by the exercise of pastoral power (Kamete, 2011). The analysis reflected key points from the literature including:

- coastal adaptation planning requires effective governance and the "reforming of power relations through public participation" (Elling, 2017, p. 236); and
- coastal adaptation planning requires the integration of a diversity of perspectives to leverage anticipatory action, enabled through community empowerment (Anderson, 2010; Metzger, Allmendinger, & Kornberger, 2021).

The thematic analysis of Takutai Kāpiti also provided insights into the extent of input necessitated to provide a 'robust' level of information to inform coastal adaptation planning. Misiune et. al (2022) noted that "there are multiple independencies between people and nature that must be addressed simultaneously" and to do this adaptation planning requires "a transdisciplinary approach to bridge differences in perspectives and methodologies …" (p. 4). The case study showed that, in coastal adaptation planning, planners are required to bridge differences across technical disciplines, including qualitative value-based assessments and more quantitative assessments on risk assessment.

The Takutai Kāpiti project demonstrated statutory alignment with national guidance and collaborative decision-making. However, differences were identified in the wider application of national and local directives, including standardised qualifications of value, that were refined and applied in landscape assessments. For example, differences were observed between the expert driven assessments of risk, and community informed perceptions of risk for Kāpiti. For instance, the CHSV reflected the application of an exclusively technocratic approach in the first phase of Takutai Kāpiti, and an overly cautious approach to the impact of coastal hazard risks is observed, that did not necessarily capture the true complexities of risk interpretation.

The analysis observed more nuanced findings on coastal adaptation from the exercises which demonstrated genuine engagement with the community. The community workshop reports, such as the Raumati Area Report (2023), offered deeper insights into the communities' current perceptions of risk, which leaned towards an appreciation for maintaining the status quo. This is important, because how communities value their landscapes is intrinsically linked to their acceptance of coastal adaptation pathways (Glavovic & Smith, 2014; Sesana, Gagnon, Ciantelli, Cassar, & Hughes, 2021). In the ECO (2024) gaining knowledge and information on values and perceptions of risk was also achieved through inclusive engagement practices. The SIA (2024) and the CVA (2023) documents were examples of assessments that provided more nuanced insights on risk and value, from the perception of the wider community.

The literature highlighted the significance of incorporating Mātauranga Māori into planning processes through inclusive engagement practices (Matunga, 2000; Mead, 2012). The CVA (2023) provided a substantial amount of information on cultural values, trends and patterns related to the indigenous use of the landscape, in the context of natural hazards. Tools such as negotiated space and a braided rivers approach, designed to provide a safe and inclusive opportunity to exchange knowledge, were recommended in the CVA to be applied in Takutai Kāpiti. However, the analysis observed a lack of integration between the two primary knowledge systems: Mātauranga Māori and Western Science. There was no obvious negotiation or integration of cultural values, as cultural values were only briefly reflected in the final CAP recommendations report. The analysis highlighted that assessment of cultural values was treated as a parallel workstream, reflecting the persistent divide between the use of expert and other forms of knowledge, to inform planning practices (Pascual, et al., 2022; Swaffield & Foster, 2000).

The case study also highlighted the significant power that communities hold in the legitimisation and the adoption of planning and policy mechanisms (Fischer, 2000; Elling, 2017). The second phase of Takutai Kāpiti revealed inclusive practices and collaborative decision making across levels of governance and the community; enabled through the sharing of information and experiences between Council, as the governing body accountable for adopting the recommendations, other stakeholders, and the community who also provided input into the recommendations. Phase 3 showcased the transition of power and governance from a state of planning, towards action.

The incorporation of values in Takutai Kāpiti is primarily enabled through the DMF (2022), which required those participating in the process to "turn what was learned about hazards susceptibility and social/cultural values … into a set of recommendations for coastal hazards adaptation…" (p. 3). Efforts were made early in Takutai Kāpiti to embed core principles of inclusivity and collaboration into the decision-making framework.Despite this, the analysis of the approaches undertaken to develop values-based assessments exposed inconsistencies in the application of these principles across assessments. This highlighted the complexity of reconciling landscape values in practice.

6.3 Recommendations for Future Research and Practice

Responses to coastal hazards can require a tradeoff between multiple potentially conflicting values and priorities at both the local and national scale. Value-based risk management in coastal adaptation planning is centered around what is considered important and deserving of preservation, protection and management. The decisions made and ensuing outcomes reflect the underlying power relations and valuation methodologies used to inform and determine such decisions.

As discussed in the literature on climate change that was reviewed, the scale and effect of coastal hazard events will vary from locale to locale, and each location has its own intricacies, uniqueness and vulnerabilities. (Begum, et al., 2022). Future research could focus on developing methodologies that better integrate diverse values of nature into risk assessment, to inform coastal adaptation planning. This would include refining approaches to value-based assessment to capture a broad range of community perspectives.

The purpose of the Takutai Kāpiti Coastal Adaptation Project was to empower residents to take part in the development of coastal adaptation pathways, to ensure that the outcomes will be appropriate and realistically achievable for the community. Key insights for planners from this research include that they:

- should continue to prioritise genuine public engagement in coastal adaptation planning.
- function as facilitators and conduits between various actors, ensuring that community input is meaningfully integrated into planning processes.
- foster community resilience and the acceptance of adaptation measures.

For Takutai Kāpiti, the DMF (2022) was identified as a key document, which ensured the embedment of local context in coastal adaption planning and raising the significance of

community input. A diverse foundation of baseline information requirements was prescribed by the DMF, alongside a clear expectation that the gathering of this information is to be done 'in consultation with the community'. Efforts were required to ensure that potential outcomes are aligned with community values, in meeting a 'preferred consensus'. My analysis highlighted that greater efforts should also be made to bridge the gap between Mātauranga Māori and Western knowledge systems. This includes the fostering of positive environments for collaborative research and planning practices that integrate indigenous knowledge systems. Using social inclusive, value-based approaches present opportunities for meaningful interventions that are reflective of equitable governance, legitimized by the communities most affected.

The Takutai Kāpiti Coastal Adaptation Project reflects a turn towards re-imagined futures that are pre-determined by the context of their communities (Herbeck & Siriwardane-de Zoysa, 2022). The case study presents an example of the multitude of efforts required to facilitate coastal adaptation planning. Collaboration, transparency and consensus are core principles embedded throughout Takutai Kāpiti. This research shows that incorporating these principles is validated by a reduction of the potential for misalignment of value interpretation, hierarchy and qualification. Demonstrating an evolution of practice, the Takutai Kāpiti Coastal Adaptation Project is a contemporary example of coastal adaptation planning in practice

Overall, the findings of this research build on the work of Narayan, et al. (2020) who stated that "even when responding to the same hazard, adaptation responses can vary significantly depending on local priorities and capacities*"* (p. 199). Shortcomings in the approach to some landscape assessments were identified that underscore the need for more inclusive and comprehensive approaches for coastal adaptation planning. Notwithstanding, the underlying philosophy and general approach to Takutai Kāpiti was observed to align with the contemporary discourse on coastal adaptation planning. Fundamentally, this research confirms that coastal adaptation planning is a 'wicked problem', a complex and contentious social and physical issue that is not easily understood, or able to be solved (Rittel & Webber, 1973, p. 160). Rather, by applying DAPP, coastal adaptation can only be re-solved over and over.

References

Abeysinghe, A. C., Burton, I., Gao, Q., Lemos, M. C., Masui, T., Karen, O. L., & Warner, K. (2014). *Climate-Resilient Pathways: Adaptation, Mitigation, and Sustainable Development. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the AR5 IPCC.* Cambridge: Cambridge University Press.

Adger, N. W., Hughes, T. P., Folke, C., Carpenter, S. R., & Rockstrom, J. (2005). Social-Ecological Resilience to Coastal Disasters. *Science, 309*, 1036-1039.

Alexander, D. E. (2013, April). Resilience and disaster risk reduction: an etymological journey. *Natural Hazards and Earth System Sciences*, 2707-2714. doi:doi:10.5194/nhess-13-2707-2013

Allan, S., & Fowler, R. (2014). *Independent Review of the Kāpiti Coast Proposed District Plan.* Coastal Restoration Trust of New Zealand. Retrieved from https://ref.coastalrestorationtrust.org.nz/site/assets/files/7952/independent_review_of_the_Kāpiti_coast_pdp.pdf

Anderson, B. (2010). Preemption, precaution, preparedness: Anticipatory action and future geographies. *Progress in Human Geography, 34*(6), 777-798.

Antrop, M. (2018). A brief history of landscape research. *The Routledge companion to landscape studies*, 1-15.

Atkinson, P., & Coffey, A. (1997). Analysing Documentary Realities. In D. Silverman, *Qualitative Research: Theory, Method and Practice* (pp. 45-62). Sage Publications.

Australian Institute of Disaster Resilience. (2022, July). *Creating a post-earthquake emergency sanitation plan for the Wellington region, Aotearoa New Zealand*. Retrieved from Australian Disaster Resilience Knowledge Hub: https://knowledge.aidr.org.au/resources/ajem-july-2022-creating-a-post-earthquake-emergency-sanitation-plan-for-the-wellington-region-aotearoa-new-zealand/

Beck, U. (2006). Living in the world risk society. *Economy and Society, 35*(3), 329-345.

Becker, J. S., Payne, B. A., & Paton, D. (2020). *Understanding readiness for disasters on the East Coast, North Island, Aotearoa New Zealand: A summary of preparedness surveys.* Wellington: Joint Centre for Disaster Research.

Begum, A. R., Lempert, R., Ali, E., Benjaminsen, T. A., Bernauer, T., Cramer, W., . . . Wester, P. (2022). Point of Departure and Key Concepts. In H. O. Portner, D. C. Roberts, M. Tignor, E. S. Poloczanska, K. Mintenbeck, M. Craig, . . . B. Rama, *Climate Change 2022: Impacts, Adaptation and Vulnerability* (pp. 121-196). Cambridge, United Kingdom and New York: Cambridge University Press.

Bishop, H., & Court, S. (2024, September 20). Replacement for the Resource Management Act takes shape. Te Kāwanatana o Aotearoa, New Zealand Government. Retrieved from https://www.beehive.govt.nz/release/replacement-resource-management-act-takes-shape

Boffa Miskell. (2019). *Natural Character: Concept Development in New Zealand Planning Law and Policy.* Hamilton: Environment Waikato.

Boffa Miskell Limited. (2024). *Kāpiti Coast Natural Character Evaluation.* Wellington: Kāpiti Coast District Council.

Borrie, W. T., & Armatas, C. A. (2022). Chapter 2: Environmental Values and Nature's Contributions to People: Towards Methodological Pluralism in Evaluation of Sustainable Ecosystem Services. In I Misiune et al., *Human-Nature Interactions* (pp. 13-23). Springer Nature.

Boustain, L. P., Kahn, M. E., Rhode, P. W., & Yanguas, M. L. (2020, July). The effect of natural disasters on economic activity in US counties: A century of data. *Journal of Urban Economics, 118*. doi:10.1016/j.jue.2020.103257

Bowen, G. A. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal, 9*(2), 27-40.

Braun, & Clarke. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.

Braun, V., & Clarke, V. (2021). *Thematic Analysis - A Practical Guide.* Sage Publications.

Brown, T. C. (1984). The concept of value in resource allocations. *Land Economics, 60*(3), 231-246.

Bryman, A. (2016). *Social Research Methods (5th Ed.).* Oxford University Press.

Burns, R. B. (2000). *Introduction to Research Methods.* London: Sage.

Cassatella, C., & Peano, A. (2011). *Landscape Indicators: Assessing and Monitoring Landscape Quality.* Springer.

Chiesura, A. (2003). The role of urban parks for the sustainable city. *Landscape and Urban Planning*(68), 129-138.

Clark, V. L., & Ivankova, N. V. (2015). *Mixed Methods Research: A Guide to the Field.* London: Sage Publications.

Coastal Team - Takutai Kāpiti. (2023). *Coastal Advisory Panel Engagement: Raumati Adaptation Area Summary.* Kāpiti: Kāpiti Coast District Council.

Coffey, A. (2014). Analysing documents. *The SAGE Handbook of Qualitative Data Analysis*, 367-379.

Conacher, J. (2000). *Environmental Planning in Australia.* Melbourne: Oxford University Press.

Concha-Homes, A., & Oliver-Smith, A. (2019). *Disasters in Paradise: Natural Hazards, Social Vulnerability and Development Decisions.* London: Lexington Books.

Cooper, J., & Pile, J. (2014). The adaptation-resistance spectrum: A classification of contemporary adaptation approaches to climate-related coastal change. *Ocean & Coastal Management, 98*, 90-98.

Corbin, J., & Strauss, A. (2008). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory.* California: Sage Publications.

Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches.* London: Sage Publications.

Davies, A., Hoggart, K., & Loretta, L. (2002). *Researching Human Geography.* London: Routledge.

Department of Conservation. (1994, May 5). The New Zealand Coastal Policy Statement 1994. Retrieved from https://www.doc.govt.nz/globalassets/documents/conservation/marine-and-coastal/coastal-management/nz-coastal-policy-statement-1994-superseded.pdf

Dioniso, D., Walker, D., Macfarlane, A., Yates, A., & Matunga, H. (2024). Enhancing cultural diversity and equity in spatial planning systems in Aotearoa New Zealand with He Awa Whiria. In A. Macfarlane, M. Derby, & S. Macfarlane, *He Awa Whiria: Braiding the knowledge streams in research, policy and practice.* Christchurch: Canterbury University Press.

Elling, B. (2017). Communicative planning as counter-power. *International Planning Studies, 22*(3), 226-241.

Environmental Defence Society v Mangonui County Council, 385 (NZRMA April 12, 1994).

Environmental Protection Authority: Te Mana Rahui Taiao. (2020). *Guide to the mātauranga framework.* Wellington: EPA.

Ericksen, N. J., Berke, P. R., Crawford, J. L., & Dixon, J. E. (2003). *Planning for Sustainability: New Zealand Under the RMA.* Hamilton: The International Global Change Institute.

Fairclough, N. (2003). *Analysing Discourse: Textual Analysis for Social Research.* London: Routledge.

Fekete, A., & Montz, B. (2018). Vulnerability: An Introduction. In S. Fuchs, & T. Thaler, *Vulnerability and Resilience to Natural Hazards* (pp. 14-31). Cambridge University Press.

Fischer, F. (2000). Citizens, Experts and the Environment. Durham: Duke University Press.

Flyvbjerg, B. (1998). *Rationality and Power: Democracy in Practice.* Chicago: University of Chicago Press.

Flyvbjerg, B. (2006). Five Misunderstandings About Case-Study Research. *Qualitative Inquiry, 12*(2), 219-245.

Forester, J. (1989). *Planning in The Face of Power.* Berkeley: University of California Press.

Friedmann, J. (2008). The Uses of Planning Theory: A Bibliographic Essay. *Journal of Planning Education and Research, 28*, 247-256. doi:10.117/0739456

Fritzche, D. J., & Oz, E. (2007). Personal Values' Influence on Ethical Dimension of Decision Making. *Journal of Business Ethics*(75), 335-343.

Gibton, D. (2016). *Researching Education Policy, Public Policy and Policymakers: Qualitative methods and ethical issues.* New York: Routledge.

Glavovic, B. C., & Smith, G. P. (2014). *Adapting to Climate Change: Lessons from Natural Hazards Planning.* New York: Springer. doi:10.1007/978

Gooder, C. (2018). *Negotiating kāwanatanga and rangatiratanga through local government planning process in Aotearoa, New Zealand: A review of literature.* Auckland: Auckland Council.

Greater Wellington Regional Council. (2023). *Natural Resources Plan.* Retrieved from Greater Wellington Regional Council: https://www.gw.govt.nz/assets/Documents/2023/07/Natural-Resource-Plan-Operative-Version-2023-incl-maps-compressed.pdf

Greater Wellington Regional Council. (2024). *Regional Policy Statement for the Wellington region.* Retrieved from Greater Wellington Regional Council: https://www.gw.govt.nz/your-region/plans-policies-and-bylaws/policies/regional-policy-statement/

Green, R. J. (2010). *Coastal towns in transition: local perceptions of landscape change.* London: Springer.

Griggs, G. B. (2005). The Impacts of Coastal Armoring. *Shore & Beach, 73*(1), 13-22.

Hall, D. (2022). *Adaptation finance: Risks and opportunities for Aotearoa.* Auckland: Ministry for the Environment.

Hanara, B. D., & Jackson, D.-M. (2019). *Tangaroa Ara Rau: Tangaroa the Atua of Human Movement.* Auckland: Ngā Pae o te Māramatanga - NZ Maori Centre of Research Excellence.

Hanna, C. J. (2019). Restraints of change: limits to 'managed retreats' in Aotearoa New Zealand (Thesis, Doctor of Philosophy (PhD)). Hamilton, New Zealand: The University of Waikato. Retrieved from https://hdl.handle.net/10289/12896

Harrington, L. J., Dean, S. M., Awatere, S., Rosier, S., Queen, L., Gibson, P. B., . . . Otto, F. E. (2023). *The role of climate change in extreme rainfall associated with Cyclone Gabrielle over Aotearoa New Zealand's East Coast.* World Weather Attribution. doi:10.25561/102624

Hayward, B. (2008). 'Nowhere Far From the Sea': Political Challenges of Coastal Adaptation to Climate Change in New Zealand. *Political Science, 60*(1), 47-59.

Hayward, J. (2025, March 1). *Principles of the Treaty of Waitangi – ngā mātāpono o te Tiriti o Waitangi - Treaty principles developed by the Waitangi Tribunal.* Retrieved from Te Ara - the Encyclopedia of New Zealand: http://www.TeAra.govt.nz/en/principles-of-the-treaty-of-waitangi-nga-matapono-o-te-tiriti-o-waitangi

Hennessy, K. B., Fitzharris, B. C., Bates, N., Harvey, S. M., Howden, L., Hughes, J., . . . Warrick, R. (2007). *Australia and New Zealand: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth*

Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, UK: Cambridge University Press.

Herbeck, J., & Siriwardane-de Zoysa, R. (2022). Chapter 6: Transformations of Urban Coastal Nature(s): Meanings and Paradoxes of Nature-Based Solutions for Climate Adaptation in Southeast Asia. In I. Misiune et al., *Human-Nature Interactions* (pp. 61-70). Springer Nature.

Hino, M., Field, C. B., & Mach, K. J. (2017). Managed retreat as a response to natural hazard risk. *Nature Climate Change*. doi:10.1038/NCLIMATE3252

Hubert, L. D., & Rabinow, P. (1982). *Michel Foucalt: Beyond Structuralism and Hermeneutics.* Chicago: The Harvester Press Limited.

Huxley, M. (2013). Historicizing Planning, Problematizing Participation. *International Journal of Urban and Regional Research, 37*(5), 1527-41.

Infrastructure New Zealand. (2023, August 10). *Position Paper: Climate Resilient Infrastructure.* Retrieved from Infrastructure New Zealand: https://infrastructure.org.nz/wp-content/uploads/2023/08/Infrastructure-NZ-Policy-Postions-Climate-Resilient-Infrastructure-v2.pdf

Inmaculada de, M.-M. (2018). *The fight against doubt: how to bridge the gap between scientists and the public.* New York: Oxford University Press.

Institute of Geological and Nuclear Sciences Limited. (2021, April). *Natural Hazards and Risks: Ngā Matepā me ngā Tūraru ā Taiao*. Retrieved from GNS Science: Te Pū Ao: https://www.gns.cri.nz/our-science/natural-hazards-and-risks/

IPCC. (2012). *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation: A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change.* New York: Cambridge University Press.

IPCC. (2023). *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* Geneva, Switzerland: IPCC. doi:10.59327/IPCC/AR6-9789291691647

IPCC. (2023). *Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* Geneva, Switzerland: IPCC. doi:10.59327/IPCC/AR6-9789291691647.001

J Ataria, M. M.-S. (2018). Whakamanahia Te mātauranga o te Māori: empowering Māori knowledge to support Aotearoa's aquatic biological heritage. *New Zealand Journal of Marine and Freshwater Research, 52*(4), 467-486.

Jacobs. (2023). *Coastal Risk-Based Planning: Thresholds and Scenarios.* Kāpiti: Kāpiti Coast District Council.

Jacobs NZ Ltd. (2022). *Kāpiti Coast Coastal Hazards Susceptibility and Vulnerability Assessment.* Christchurch: Kāpiti Coast District Council.

Kadetz, P., Mock, N. B., & Zakour, M. J. (2018). *Creating Katrina, rebuilding resilience: lessons from New Orleans on vulnerability and resiliency.* Oxford: Butterworth-Heinemann.

Kamete, A. Y. (2011). Interrogating planning's power in an African city: Time for reorientation? *Planning Theory, 11*(1), 66-88.

Kāpiti Coast District Council. (2017). *Council Decisions on Submissions to the Proposed Kāpiti Coast District Plan and Variation 1 Urban Tree Variation.* Kāpiti: Kāpiti Coast District Council.

Kāpiti Coast District Council. (2022). *Terms of Reference for the Takutai Kāpiti Coastal Advisory Panel: Final Agreed Version 21 March 2022.* Kāpiti Coast District Council.

Kāpiti Coast District Council. (2024). *Ecological Values Review.* Kāpiti: Kāpiti Coast District Council.

Kāpiti Coast District Council. (2024). *Takutai Kāpiti*. Retrieved from Kōrero mai | Have your say: https://haveyoursay.Kāpiticoast.govt.nz

Kilvington, M., & Saunders, W. (2019). Gaining public input on natural hazard risk and land-use planning: A case study from New Zealand. *Disaster Prevention and Management, 28*(2), 228-244.

Kisacik, D., Ozyurt Tarakcioglu, G., & Cappietti, L. (2022). Adaptation measures for seawalls to withstand sea-level rise. *Ocean Engineering, 250*, 1-21.

Lane, M. B. (2005). Public Participation in Planning: an intellectual history. *Australian Geographer, 36*(3), 283-299.

Lave, R. (2015). The Future of Environmental Expertise. *Annals of the Association of American Geographers, 105*(2), 244-252.

Lawrence, J., & Bell, R. (2024). *Coastal Hazards and Climate Change Guidance.* Wellington: Ministry for the Environment.

Lawrence, J., Bell, R., & Stroombergen, A. (2019). A Hybrid Process to Address Uncertainty and Changing Climate Risk in Coastal Areas Using Dynamic Adaptive Pathways Planning, Multi-Criteria Decision Analysis & Real Options Analysis: A New Zealand Application. *Sustainability, 11*(2), 1-18.

Lawrence, J., Bell, R., Blackett, P., Ryan, E., & Robichaux, L. (2019). A Practice Brief: From guidance to practice - The adaptation transition at the coast. *Planning Quarterly*(214). Retrieved from https://ref.coastalrestorationtrust.org.nz/site/assets/files/9832/lawrence-et-al-2019-pq-published-version.pdf

Le Treut, H., Cubasch, U., Somerville, R., Ding, Y., Mauritzen, C., Mokssit, A., . . . Prather, M. (2007). Historical Overview of Climate Change. In S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, . . . H. L. Miller, *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report* (pp. 94-127). Cambridge, United Kingdom and New York: Cambridge University Press.

LGNZ. (2024, December 17). *Councils relieved of 'well-being' obligations*. Retrieved from LGNZ Local Government Magazine: https://localgovernmentmag.co.nz/councils-relieved-of-well-being-obligations/

Lowenthal, D. (1978). *Finding Valued Landscapes.* London: University College London.

Lupton, D. (1999). *Risk.* London: Routledge.

MacDonald, K., & Blazey, N. (2022). *Takutai Kāpiti: Coastal hazards adaptation decision-making framework.* Kāpiti Coast: Kāpiti Coast District Council.

Macfarlane, A., Derby, M., & Macfarlane, S. (2024). *He Awa Whiria - Braiding the knowledge streams in research, policy and practice.* Christchurch: Canterbury University Press.

Malm, A., & Hornborg, A. (2014). The geology of mankind? A critique of the Anthropocene narrative. *The Anthropocene Review, 1*(1), 62-69.

Mannakkara, S., Elkhidir, E., & Matiu, A. (2023). The Journey Towards Understanding and Valuing Indigenous Knowledge of Climate Change Adaptation in Northland, Aotearoa-New Zealand. *Indigenous Knowledge and Disaster Risk Reduction*, 387-416.

Massey University. (2018). Code of Responsible Research Conduct. *Massey University Policy Guide*. Massey University.

Matunga, H. (2000). Decolonising Planning: The Treaty of Waitangi, the Environment and a Dual Planning Tradition. *Environmental planning and management in New Zealand*, 36-47.

Maven. (2024). *Takutai Kāpiti Social Impact Assessment.* Wellington: Kāpiti District Council.

McHarg, I., & Steiner, F. (2006). *The Essential Ian McHarg: Writings on Design and Nature.* Washington: Inland Press.

Mead, S. (2012). Understanding Mātauranga Māori. In T. Black, D. Bean, W. Collings, & W. Nuku, *Conversations on Mātauranga Māori* (pp. 9-14). NZQA.

Melnick, R. Z. (2009). Climate Change and Landscape Preservation: A Twenty-First-Century Conundrum. *Journal of Preservation Technology*, 35-42.

Metzger, J., Allmendinger, P., & Kornberger, M. (2021). Ideology in practice: the career of sustainability as an ideological concept in strategic urban planning. *International Planning Studies, 26*(3), 302-320.

Meyer, W. B., & Esposito, C. R. (2014). Burgess and Hoyt in Los Angeles: testing the Chicago models in an automotive-age American city. *Urban Geography, 36*(2), 314-325. doi:10.1080/02723638.2014.973312

Milanović, P. A. (2019). Natural Hazards: Interpretations, Types and Risk Assessment. In F. W. Leal, A. Azul, L. Brandli, P. Özuyar, & T. Wall, *Climate Action* (pp. 1-14). Springer. doi:10.1007/978-3-319-71063-1_15-1

Ministry for the Environment. (2020). *National Climate Change Risk Assessment for Aotearoa New Zealand* . Wellington: Ministry for the Environment.

Ministry for the Environment. (2020). *National Climate Change Risk Assessment for New Zealand: Main Report – Arotakenga Tūraru mō te Huringa Āhuarangi o Āotearoa: Pūrongo whakatōpū.* Wellington: Ministry for the Environment.

Ministry for the Environment. (2022). *Aotearoa New Zealand's first national adaptation plan.* Wellington: Ministry for the Environment.

Ministry for the Environment. (2022, August 3). *First national climate change risk assessment for New Zealand*. Retrieved from Ministry for the Environment: https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/adapting-to-climate-change/first-national-climate-change-risk-assessment-for-new-zealand/

Ministry for the Environment and Stats NZ. (2019). *New Zealand's Environmental Reporting Series: Our marine environment 2019.* Wellington: Ministry for the Environment and Stats NZ.

Misiune, I., Deoekkegrin, D., & Egarter Vigi, L. (2022). Chapter 1: Conceptualizing Human-Nature Interactions. In .. I Misiune et al, *Human-Nature Interactions* (pp. 3-11). Springer Nature.

Narayan, S., Esteban, M., Albert, S., Jamero, M., Crichton, R., Heck, N., . . . Jupiter, S. (2020). Local adaptation responses to coastal hazards in small island communities: insights from 4 Pacific nations. *Environmental Science and Policy, 104*, 199-207.

National Science Challenges. (2023, April). *Policy Brief: Enabling Coastal Adaptation - Use of existing legislation*. Retrieved from National Science Challenges: Resilience to Nature's Challenges: https://resiliencechallenge.nz/wp-content/uploads/Policy-Brief_Enabling-Coastal-Adaptation_230501.pdf

New Zealand Coastal Policy Statement. (2010). Retrieved from https://www.doc.govt.nz/about-us/science-publications/conservation-publications/marine-and-coastal/new-zealand-coastal-policy-statement-2010

New Zealand Coastal Society. (2022). *Coastal Adaptation: Adapting to coastal change and hazard risk in Aotearoa New Zealand.* Wellington: New Zealand Coastal Society.

New Zealand Parliament. (2023, December 19). Resource Management (Natural and Built Environment and Spatial Planning Repeal and Interim Fast-track Consenting) Bill — First Reading. Retrieved from https://www.parliament.nz/en/pb/hansard-debates/rhr/combined/HansDeb_20231219_20231219_60

NIWA. (2021, May). *Overview of New Zealand's climate*. Retrieved from NIWA: Climate, Freshwater & Marine Science: https://niwa.co.nz/climate-and-weather/overview-new-zealands-climate

NIWA. (2024). *Cyclone Gabrielle Extreme Value Analysis: Flood Flows.* Christchurch: Hawkes Bay Regional Council.

NZ Govt. (2020). *Te Mana o Te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020.* Wellington: Department of Conservation.

O'Donnell, T. (2022). Managed retreat and planned retreat: a systematic literature review. *Philosophical Transactions of The Royal Society Biological Sciences, 377*(1854), 1-12.

O'Donnell, T. (2022). Managed retreat and planned retreat: a systematic literature review. *Philosophical Transactions of The Royal Society Biological Sciences*.

Oppenheimer, M., Glavovic, B. C., Hinkel, J., van de Wal, R., Magnan, A. K., Abd-Elgawad, A., . . . Sebesvari, Z. (2019). Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities. In H. O. Portner, D. C. Roberts, V. Masson-Delmotte, P. Zhaj, M. Tignor, E. Poloczanska, . . . N. M. Weyer, *IPCC Special Report on the Ocean and Cryosphere in a Changing* (pp. 321-445). Cambridge, UK and New Zealand: Cambridge University Press.

Ottinger, G. (2010). Buckets of Resistance: Standards and Effectiveness of Citizen Science. *Science Technology & Human Values, 35*(2), 244-270.

Oxford University Press. (2023). *Oxford English Dictionary.* Retrieved from https://www.oed.com/search/dictionary

Parliamentary Commissioner for the Environment. (2015, November). *Publications: Preparing New Zealand for rising seas: Certainty and uncertainty*. Retrieved from Parliamentary Commissioner for the Environment: https://pce.parliament.nz/publications/preparing-new-zealand-for-rising-seas-certainty-and-uncertainty

Pascual, U., Balvanera, P., Christie, M., Baptiste, B., González-Jiménez, D., Anderson, C. B., . . . Vatn, A. (2022). *Summary for Policymakers of the Methodological Assessment Report on the Diverse Values and Valuation of Nature.* Germany: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).

Paulik, R., Stephens, S., Wadhwa, S., Bell, R., Popovich, B., & Robinson, B. (2019). *Coastal Flooding Exposure Under Future Sea-level Rise for New Zealand.* Wellington: National Institute of Water & Atmospheric Research Ltd.

Pettenati, G. (2023). *Landscape as Heritage: International Critical Perspectives.* New York: Routledge.

Potschin, M., Kretsch, C., Haines-Young, R., Furman, E., Berry, P., & Baro, F. (2016). *Nature Based Solutions.* OpenNESS.

Reimann, L., Vafeidis, A. T., Brown, S., Hinkel, J., & Tol, R. (2018). Mediterranean UNESCO World Heritage at risk from coastal flooding and erosion due to sea-level rise. *Nature Communications*, 1-11.

Resource Management Act. (1991). Retrieved from https://www.legislation.govt.nz/act/public/1991/0069/latest/DLM230265.html

Rittel, H. W., & Webber, M. M. (1973). Dilemas in a General Theory of Planning. *Policy Sciences, 4*(2), 155-169.

Rouse, H. L., Bell, R. G., Lundquist, C. J., Blackett, P. E., Hicks, D. M., & King, D. N. (2017). Coastal adaptation to climate change in Aotearoa-New Zealand. *NZ Journal of Marine and Freshwater Research, 51*(2), 183-222.

Rt Hon Jacinda Ardern. (2020). *Motions: Climate Change Declaration of Emergency.* New Zealand Parliament. Hansard.

Rubooga, E. K. (2024). *Bridging Knowledge and Practice: A Values-Based Approach to Coastal Adaptation.* Vancouver: University of British Columbia.

Rulleau, B., & Rey-Valette, H. (2017, June). Forward planning to maintain the attractiveness of coastal areas: Choosing between seawalls and managed retreat. *Environmental Science & Policy, 72*, 12-19.

Scheller, R. M. (2020). *Managing Landscapes for Change.* USA: Springer.

Select Bipartisan Committee, U.S House of Representatives. (2006). *A Failure of Initiative: Final Report to Investigate the Preparation for and Response to Hurrican Katrina.* Washington: U.S. Government Printing Office.

Sesana, E., Gagnon, A. S., Ciantelli, C., Cassar, J., & Hughes, J. J. (2021). Climate change impacts on cultural heritage: A literature review. *WIREs Climate Change, 12*(4), 1-29.

Spinks, A., Poutama, L., & Poutama, M. (2022). *Cultural Values Assessment Report for the Takutai Kāpiti Community-Led Coastal Adaptation Project.* Kāpiti: Kāpiti Coast District Council.

Stats NZ: Tatauranga Aotearoa. (2024). *Statistics New Zealand*. Retrieved from 2018 Census place summaries: Kāpiti Coast District: https://www.stats.govt.nz/tools/2018-census-place-summaries/Kāpiti-coast-district

Stats NZ: Tatauranga Aotearoa. (2025, April 16). *Stats NZ: Tatauranga Aotearoa*. Retrieved from Estimated resident population (2023-base): https://www.stats.govt.nz/information-releases/estimated-resident-population-2023-base-at-30-june-2023/

Steffen, W., Grinevald, J., Crutzen, P., & McNeil, J. (2011). The Anthropocene: conceptual and historical perspectives. *The Royal Society*, 842-867.

Sun, R., Gao, G., Gong, Z., & Wu, J. (2020). A review of risk analysis methods for natural disasters. *Natural Hazards 100*, 571-593.

Swaffield, S. R., & Foster, R. J. (2000). Community perceptions of landscape values in the south island high country. *Science for Conservation*, 1173-2946.

Swapan, M., & Khan, S. (2013). From blueprint masterplans to democratic planning in South Asian cities: Pursuing good governance agenda against prevalent patron-client networks. *Habitat International, 38*, 183-191.

Takutai Kāpiti Coastal Advisory Panel. (2024). *Takutai Kāpiti Coastal Hazard Adaptation Project: Report of the Independant Coastal Advisory Panel.* Kāpiti: Kāpiti Coast District Council.

Taylor, N. (1999). Anglo-American town planning theory since 1945: three significant developments but no paradigm shifts. *Planning Perspectives, 14*(4), 327-345.

The Paris Agreement. (2024). Retrieved from United Nations Framework Convention on Climate Change: https://unfccc.int/process-and-meetings/the-paris-agreement

Thomas, D. S., Phillips, B. D., Lovekamp, W. E., & Fothergill, A. (2013). *Social Vulnerability to Disasters - Second Edition.* Boca Raton: CRC Press.

Tierney, K. (2014). *The social roots of risk: producing disasters, promoting resilience.* Stanford, California: Stanford University Press.

Tizot, J.-Y. (2018). Ebenezer Howard's Garden City Idea and the Ideology of Industrialism. *OpenEdition Journals*. doi:10.4000/cve.3605

Uekusa, S., & Matthewman, S. (2017). Vulnerable and resilient? Immigrants and refugees in the 2010–2011 Canterbury and Tohoku disasters. *International Journal of Disaster Risk Reduction*, 355-361.

UNESCO. (2011). *2003 Convention for the Safeguarding of the Intangible Cultural Heritage.* Bali, Indonesia: UNESCO.

United Nations Office for Disaster Risk Reduction. (2015). *The Sendai Framework for Disaster Risk Reduction 2015-2030.* Japan: United Nations.

Vigl, L. E., Deppellegrin, D., & Misiune, I. (2022). Chapter 1: Conceptualising Human-Nature Interactions: An Overview. In I. M. al., *Human-Nature Interactions* (pp. 4-9). Springer Nature.

Waitangi Tribunal. (1997). *The Ngai Tahu Report 1991. Vol. 1.* Retrieved from www.waitangi.tribunal.govt.nz

Weinkle, J., & Pielke, R. (2017). The Truthiness about Huricane Catastrophe Models. *Science, Technology & Human Values, 42*(4), 547-576.

Wetherell, M. (2012). *Affect and Emotion: A New Social Science Understanding.* ResearchGate.

Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). *At risk: natural hazards, people's vulnerbility and disasters* (2nd ed.). London; New York: Routledge.

Wisner, B., Gaillard, J. C., & Kelman, I. (2011). Framing disaster. In B. e. Wisner, *The Routledge Handbook of Hazards and Disaster Risk Reduction* (pp. 18-33). Routledge.

Yin, R. K. (2018). *Case Study Research and Applications: Design and Methods (6th Ed.).* Sage Publication Inc.

Appendix

Example of data collated as drawn from literature (Chapter 2), aligned to the concepts and themes used in the Concentric Framework for Coastal Adaptation Planning.

VALUE-BASED RISK ASSESSMENT IN COASTAL ADAPTATION PLANNING									
Global	**Risk-Based Assessment** Key Authors: (Lupton, 1999; Beck, 2006)				**Value-Based (Landscape) Assessment** Key Authors: (Brown, 1984; Fritzche & Oz, 2007)				**Local**
Power and Governance	**Uncertainty**	**Exposure and Tolerance**	**Vulnerability**	**Subjectivities and Perceptions**	**Heritage – Cultural Values**	**Relational - Social**	**Natural Values**	**Resource / Eco-Services**	**Participation and Engagement**
Exclusivity of expertise and erosion of trust; rights movements. (Thomas, Phillips, Lovekamp, & Fothergill, 2013; Lave, 2015; Inmaculada de, 2018)	*Climate change uncertainties and complexities* (Rittel & Webber, 1973; Anderson, 2010; Wisner, Gaillard, & Kelman, 2011; Weinkle & Pielke, 2017)	*Local variations of vulnerability and resilience.* (Concha-Homes & Oliver-Smith, 2019)	*Indirect exacerbation of vulnerabilities from socially and structurally biased approaches to adaptation.* (Beck, 2006; Begum, et al., 2022)	*Differing knowledges, social learnings and accepting the unacceptable.* (Glavovic & Smith, 2014)	*The significance of cultural and heritage attributes of landscapes on identity and belief.* (Hanara & Jackson, 2019; Dioniso, Walker, Macfarlane, Yates, & Matunga, 2024)	*Influence of natural attributes on social connection and wellbeing.* (Chiesura, 2003; Rulleau & Rey-Valette, 2017)	*How we value intrinsic landscape values such as natural character.* (Cassatella & Peano, 2011; Potschin, et al., 2016; Pascual, et al., 2022)	*Valuing landscapes for resource and eco-services.* (Lowenthal, 1978; Adger, Hughes, Folke, Carpenter, & Rockstrom, 2005; McHarg & Steiner, 2006; Pascual, et al., 2022)	*Building local adaptive capacity and resilience to coastal hazards.* (Adger, Hughes, Folke, Carpenter, & Rockstrom, 2005; Wisner, Blaikie, Cannon, & Davis, 2004)
Changing practices in risk assessment (Taylor, 1999; Lave, 2015; Sun, Gao, Gong, & Wu, 2020)	*Uncertainty of change on landscape values.* (Melnick, 2009; Uekusa & Matthewman, 2017)	*Maladaptive responses to coastal hazards.* (Griggs, 2005; Cooper & Pile, 2014; Kisacik, Ozyurt Tarakcioglu, & Cappietti, 2022; IPCC, 2023)	*The dynamics and complexities of social vulnerability.* (Uekusa & Matthewman, 2017; Begum, et al., 2022)	*Perceptions of affect and effectiveness.* (Narayan, et al., 2020)	*Climate change impacts on heritage.* (Reimann, Vafeidis, Brown, Hinkel, & Tol, 2018; Sesana, Gagnon, Ciantelli, Cassar, & Hughes, 2021; Pettenati, 2023)	*Effects of coastal adaptation on social and relational values.* (Scheller, 2020; Pettenati, 2023)	*Natural hazard impacts intrinsic landscape values.* (Adger, Hughes, Folke, Carpenter, & Rockstrom, 2005; Cassatella & Peano, 2011; Scheller, 2020)	*Nature based solutions and net public benefits of coastal adaptation.* (Potschin, et al., 2016; Misiune, Deoekkegrin, & Egarter Vigi, 2022)	*Local input for locally driven outcomes.* (Fischer, 2000; Ottinger, 2010; Narayan, et al., 2020; Herbeck & Siriwardane-de Zoysa, 2022) local input, community driven outcomes
Scaling up climate adaptation	*Differing knowledgebases and understandings in terms of risk and value.*	*Risk tolerances and tipping points.*	*Increased exposure to risk and low tolerance*	*Sectoral biases and polarising objectives.*	*Perceptions and subjectivities in relation to the*	*Nature based solutions to*	*Defining natural character in NZ*	*The value of landscapes to society.*	*Empowering action locally.*

globally and the State as a key mechanism of action. (Melnick, 2009; Abeysinghe, et al., 2014; Tierney, 2014; Hall, 2022; IPCC, 2023)	(Thomas, Phillips, Lovekamp, & Fothergill, 2013)	(Lawrence, Bell, & Stroombergen, A Hybrid Process to Address Uncertainty and Changing Climate Risk in Coastal Areas Using Dynamic Adaptive Pathways Planning, Multi-Criteria Decision Analysis & Real Options Analysis: A New Zealand Application, 2019; Pascual, et al., 2022)	*of change linked to social vulnerabilities.* (Wisner, Blaikie, Cannon, & Davis, 2004; Hennessy, et al., 2007; Fekete & Montz, 2018)	(Lupton, 1999; Adger, Hughes, Folke, Carpenter, & Rockstrom, 2005; Beck, 2006; Rulleau & Rey-Valette, 2017)	*preservation of heritage landscapes.* (Pettenati, 2023)	*enhance social values.* (Potschin, et al., 2016; Borrie & Armatas, 2022)	(Swaffield & Foster, 2000; Chiesura, 2003; Green, 2010; New Zealand Coastal Policy Statement, 2010; Boffa Miskell, 2019)	(McHarg & Steiner, 2006; Pascual, et al., 2022)	(Rulleau & Rey-Valette, 2017; Concha-Homes & Oliver-Smith, 2019; Becker, Payne, & Paton, 2020; Pascual, et al., 2022)
Complexities aligning objectives between entities of power and governance. (Weinkle & Pielke, 2017; Borrie & Armatas, 2022)	*Adaptation Planning such as DAPP* (Abeysinghe, et al., 2014; Lawrence, Bell, & Stroombergen, A Hybrid Process to Address Uncertainty and Changing Climate Risk in Coastal Areas Using Dynamic Adaptive Pathways Planning, Multi-Criteria Decision Analysis & Real Options Analysis: A New Zealand Application, 2019)	*Existing capabilities and resilience.* (Wisner, Blaikie, Cannon, & Davis, 2004; Tierney, 2014; Scheller, 2020)		*Perceptions of landscape value and landscape change.* (Melnick, 2009; Cassatella & Peano, 2011)	*Mātauranga Māori in NZ Planning.* (Matunga, 2000; Mead, 2012; Gooder, 2018; Environmental Protection Authority: Te Mana Rahui Taiao, 2020; Dioniso, Walker, Macfarlane, Yates, & Matunga, 2024)		*Intrinsic cultural values* (Pettenati, 2023)	*Balancing contributions of nature.* (Borrie & Armatas, 2022)	*Planners as facilitators, inclusionary practices and pastoral power.* (Forester, 1989; Taylor, 1999; Kamete, 2011; Elling, 2017)
Higher order policy and planning constraints. (Elling, 2017; Concha-Homes & Oliver-Smith, 2019; Pettenati, 2023)	*Uncertainty of effectiveness or appropriateness.* (Hino, Field, & Mach, 2017; Becker, Payne, & Paton, 2020)			*Managing conflicting values in adaptation planning* (Abeysinghe, et al., 2014; Cooper & Pile, 2014; Concha-Homes & Oliver-Smith, 2019)	*Cultural and heritage values in landscapes.* (McHarg & Steiner, 2006; Pascual, et al., 2022)				*Learnings from natural hazard events.* (Glavovic & Smith, 2014; Weinkle & Pielke, 2017)

					Indigenous cultural values in coastal adaptation planning in NZ. (Mannakkara, Elkhidir, & Matiu, 2023)				*Coastal adaptation planning in practice.* (Kilvington & Saunders, 2019; Misiune, Deoekkegrin, & Egarter Vigi, 2022; Rubooga, 2024)