Centring Culture in Public Engagement on Climate Change Adaptation: Re-shaping the Future of the NZ Tourism Sector

A report to the Deep South National Science Challenge

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THE DEEP SOUTH

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Executive Summary

Rapidly advancing climate change is a potential threat to the thriving tourism sector in Aotearoa New Zealand. Alongside the increasing scrutiny of the tourism sector for the carbon footprint of travel and visitor activities, the iconic but fragile natural assets tourism depends on such as beaches, mountains, and landscapes face a growing onslaught from unpredictable weather patterns exacerbated by climate change (Saarinen & Tervo 2006; Pham, Simmons & Spurr 2010). The effects of rising sea levels and melting glaciers are already palpable. So how can people involved with the sector manage risks to an important economic lifeline for the country? What is the current state of play on climate change adaptation in the tourism sector in New Zealand and how can the government and the industry collaboratively respond to the impacts of climate change?

This report delineates the key findings of a research project on climate change adaptation in the specific context of tourism in New Zealand and how understanding the interface between culture and climate change can help respond to the challenges of adaptation. The report draws on targeted engagement with tourism operators, industry representatives, policy planners and analysts in central and local government institutions, and community organisations, including Māori collectives. Adopting a multi-method approach, the project uses semi-structured interviews with a range of participants across both North and South Islands, virtual systems mapping sessions with stakeholders, and a stakeholder engagement-focused citizen panel to reach its findings. The project is shaped by the principles of deliberative engagement that recognise the central importance of deliberation and carefully facilitated exchange of views by participants to arrive at fresh understandings of issues and problems. These deliberative processes provide an arena in which a culture-centred framework for adaptation decision making can be put into practice. The project also embeds the core principles of Vision Mātauranga into every aspect of the research. As such, the research engages with Māori businesses and communities extensively as it looks at both tangible impacts of climate change on culture such as destruction of cultural sites (by sealevel rise, for example) and rapid changes to culturallysignificant environmental patterns as well as intangible impacts such as the potential loss of mātauranga Māori (retention of knowledge in its many forms).



The project conceptualises a culture-centred framework for public engagement on climate change adaptation. We identify values, place, power, and narrative as the key pillars of a culture-based understanding of climate change adaptation. The interplay of the four pillars of culture underpins the way in which people respond to climate change. For many in the tourism sector, we observe the prioritisation of economic values and a desire to focus on short term economic concerns profits and business survival, for example. In contrast to material values are the expression of strong cultural values, in particular by Māori communities, which rely on traditional knowledge for sustenance of life on earth. Similarly, place is another key cultural construct as is evident in the centrality of landscapes in the domain of tourism in New Zealand. The notion of power is reflected in how certain actors make infrastructure investment decisions and influence policy frameworks on the priorities of the tourism sector. Finally, from a public engagement point of view, narratives of climate change, incorporating the challenges and ways of adapting to such change, are critical. One promising avenue to apply a culture-centred framework to bring about real systemic change is through deliberative processes that can increase support for policy action on issues such as climate change.

The study identified a number of specific challenges for the tourism sector in adapting to climate change, including the lack of a national climate change adaptation strategy for tourism and an absence of centralised funding as well as coordinating mechanisms for the sector to address and adapt to climate change. The reluctance among many in the sector to face the reality of the science of climate change and the high cost of building infrastructure to protect against climate-induced events are challenges as well.

Based on the findings, the study outlines a number of recommendations for both policy makers and tourism professionals and business owners. These include formulating a national strategy on climate change adaptation for tourism, identifying funding mechanisms for upgrading tourism infrastructure with climate change in mind, working with indigenous and cultural insights into climate change issues alongside scientific data, looking beyond short-term goals to plan for the future, moving away from seasonal patterns for tourism planning, including a sharper focus on cultural tourism, and thinking of new and innovative tourism possibilities to make New Zealand a world leader in climate-sensitive tourism.



Introduction

Tourism is a major contributor to Aotearoa New Zealand's national economy, including being the country's biggest export earner and a huge employment generator (Bradley 2017; Tourism New Zealand 2019). The tourism industry contributes 20.6% of foreign exchange earnings, 6.1% of Gross Domestic Product and employs over 200,000 people (8.4% of total employment) (Stats NZ 2018). The industry is also an important economic sector for Māori. Over six million visitors engaged with activities with or related to Māori tourism in 2017, generating \$1.7 billion in foreign exchange revenue and employing 14,000 people (NZ Māori Tourism 2017). Māori-led tourism has also been identified by the government as an important area for growth in the sector (Mahuta 2018).

This economic powerhouse of a sector is, however, extremely vulnerable to rapidly-advancing climate change. For a sector that relies on the country's fragile natural assets such as its beaches, mountains and stunning landscapes, the impacts of climate change are potentially devastating (Becken 2019; Saarinen & Tervo 2006; Pham, Simmons & Spurr 2010). Past weather events give an indication of the type of challenges that tourism businesses might face in the future, including road and walking track closures, cancellation of activities and reduced tourist stays due to bad weather (Becken, Wilson & Reisinger 2010). Projections suggest that rising temperatures will have an impact on a number of natural and human systems. Tourism in New Zealand is, therefore, susceptible to a projected decrease in snowfall and loss of glaciers; changing rainfall patterns, and a likely increase in both "very extreme rainfall" and flooding in all regions; as well as an increase in drought frequency and intensity in many regions (Ministry for the Environment 2018). Furthermore, sea level rise in

the Pacific region is expected to be around 10% higher than the global average due to local conditions (Ministry for the Environment 2017).

There are growing pressures for adaptation as severe weather events increase in frequency and key infrastructure is threatened by sea level rise. Despite extensive research on climate change adaptation in New Zealand and detailed projections by earth system modellers (Arnold 2017), progress on climate change adaptation has been slow in the tourism sector because of both the immediate business priorities of the sector and a lack of a coherent national strategy on how to respond. The failure of climate change adaptation has been labelled by the World Economic Forum (2019) as "one of the most challenging global risks" and, therefore, more needs to be done to embed climate risk management into the culture of businesses and communities engaged in tourism.

This focus on culture is critical in synthesising the knowledge of values, desires, practices and life experiences with scientific knowledge. Indeed, as Amitav Ghosh (2016) says in the internationally-acclaimed *The Great Derangement*, climate change is not merely a crisis of 'nature', but more importantly, "a crisis of culture" (p.12).

The questions we seek to address in this project are:

(1) In what ways can the findings of climate change impacts and implications be brought into conversation with different cultural values for public engagement on climate adaptation?

(2) How can finding a common ground among disparate values, experiences, and circumstances help in designing risk management that improves decision-making on climate adaptation in the tourism sector?





This project was funded by the Deep South National Science Challenge's (2017) Engagement programme. Its aims align directly with the Deep South Challenge Mission of enabling "New Zealanders to adapt, manage risk, and thrive in a changing climate" and with the Challenge's configuration as "a framework that connects society with scientists". The project is also designed to specifically relate to the Challenge's *Engagement* programme and builds on research on public engagement on climate change adaptation. It meets the *Engagement* objectives of developing innovative methodologies that motivate target public groups to act on climate change adaptation.

The project, led by social scientists from the University of Waikato, brought together researchers from the *Earth System Modelling and Prediction* and *Impacts and Implications* programmes of the Challenge to engage with the tourism sector and embedded the principles of Vision Mātauranga into every aspect of the research. As part of Vision Mātauranga, the project looked at both tangible impacts such as destruction of cultural sites (by sea-level rise, for example); the disappearance of spiritually important species and cultural traditions; and rapid changes to culturallysignificant environmental patterns as well as intangible impacts such as the potential loss of mātauranga Māori (retention of knowledge in its many forms). This report provides

- A brief review of the research on climate change adaptation in the specific context of tourism and the interface between culture and climate change adaptation more broadly;
- An outline of the key dimensions of a culturecentred framework of public engagement on climate change adaptation;
- The methodology for executing the project;
- Findings and the analysis of the fieldwork; and
- A set of recommendations for policy makers as well as the tourism industry.

The report is also interspersed with spotlight boxes on research with community groups associated with, or affected by, climate change and tourism, including focussed research with Māori communities and businesses.

The context for climate adaptation in the NZ tourism sector

According to the 2018 Intergovernmental Panel on Climate Change (IPCC) report 'Global Warming of 1.5°C', the climate has warmed on average by 1 degree above preindustrial levels and we are now locked into centuries of sea level rise and continued warming which will continue to escalate unless emissions drastically reduce over the next several decades. Projections suggest that rising temperatures will have an impact on a number of natural and human systems, including increases in mean temperature, heavy precipitation, and the probability of drought (IPCC 2018; Ministry for the Environment 2018).

These impacts have major implications for the tourism sector globally and have received growing attention in the past decade from researchers in both academia and industry. On an international scale, the tourism industry is vulnerable to both climate change and climate variability (Becken & Clapcott 2011). A changing and variable climate leads to shifts in patterns of tourism and tourist mobilities (Kaján & Saarinen 2013) and, most specifically, risks the activities of enterprises highly dependent on landscapes and nature (Saarinen & Tervo 2006; Pham et al. 2010; Kaján & Saarinen 2013). Aal and Høyer (2004) provide a useful distinction between primary, secondary and tertiary climate impacts for tourism:

- Primary effects describe the impacts directly on tourism activities such as changes in temperature
- Secondary effects describe changes in the landscape or nature because of climate change



• Tertiary effects encompass the impact of policies such as those aiming to mitigate emissions on tourism through changes in travel patterns.

For a country dependent on tourism like New Zealand, the stakes are significant. The specific implications for the country include:

- Flooding of tourist hotspots due to unseasonal extreme rainfall in some regions
- Increase in the frequency of droughts in many regions, leading to depletion of water bodies and scarring of landscapes
- Decrease in snowfall, with one scenario suggesting a reduction of 30 snow days or more per year by 2090, affecting ski fields (Ministry for the Environment 2018)
- Sea level rise in the Pacific region affecting beaches and coastal resorts and holiday homes.
- Higher than average temperatures hindering the quality of outdoor tourist activities.

It is imperative for the tourism industry to adapt to the changing climate. Climate change adaptation refers to both short- and long-term strategies that respond to actual or expected impacts from climate change in socioecological systems (Moser & Ekstrom 2010). Adaptation is an exercise that is "political all the way through," with political decision-making processes guiding the management and transition of climate impacts (Eriksen et al. 2015 p.523). A growing literature details the political and social constraints and opportunities for adaptation within different contexts (Adger, Barnett, Brown, Marshall, & O'Brien 2013; Eisenack et al. 2014; Eriksen et al. 2015; Moser & Ekstrom 2010; O'Brien & Wolf 2010). Key to this is understanding the role of adaptive capacity, especially of those most vulnerable to climate impacts (Adger, Brooks, Kelly, Bentham & Eriksen 2004).

As Urwin and Jordan (2008) urge, it is crucial that the policy context in which decisions on adaptation are made is critically considered, particularly as integration of adaptation across multiple policy areas is struggling to gain pace. There are, of course, numerous barriers to planning and implementation of adaptation measures, including availability of information, thresholds of concern and response, level of agreement on approach, and availability of resources, expertise, data and evaluation methodology (Moser & Ekstrom 2010).

As the climate changes, it is crucial that industries such as those in the tourism sector are able to respond and adapt. The tourism sector in New Zealand needs to



identify and respond to the specific challenges it faces. Some of these challenges are:

- The concentration of short and medium enterprises within the sector, inadequate political action, uncertainty over climate impacts, institutional barriers, and a gap between national pronouncements and local action (Kaján & Saarinen 2013; Turton et al. 2010)
- A lack of easily understood information on climate change and adaptation (Becken 2005)
- The unevenness and varied nature of impacts across national and regional contexts (Pham et al. 2010; Becken & Clapcott 2011)
- The lack of a unified industry voice, comparative to other industries, to influence government policy (Becken & Clapcott 2011)
- The effect of mitigation policies such as carbon taxes, or behavioural shifts in attitudes to carbon intensive travel, such as flight shaming (Dickinson et al. 2011; Gössling, 2013; Higham, Cohen, Cavaliere, Reis, & Finkler 2016).

Responding to and adapting to climate change in any sector requires negotiating with competing understandings of the implications of climate change. At the heart of such a negotiation is acknowledging the notion of culture as a "particular way of life which expresses certain meanings and values" (Williams 1961) and recognition of its influence on the specific ways in which different social groups communicate (Bhavnani, Foran, Kurian & Munshi 2016). It is to meet this objective of acknowledging culture that we engage with the literature as well as a range of stakeholders to develop a culture-centred framework of public engagement for the uptake of science-based climate adaptation in NZ.

Culture and Climate Change

There has been a number of influential studies making the case for a sharper focus on culture in the last decade (e.g., Adger et al. 2013; Bulkeley, Paterson & Stripple 2016; Crow & Boykoff 2014; Kahane et al. 2012; O'Brien & Wolf 2010; Petheram et al. 2010). The literature includes studies that cover culture in a broader sense, such as indigeneity (Herman 2015; Jacob et al. 2010; Leonard et al. 2013; Sakakibara et al. 2017); gender (Bhattarai et al. 2015; Onta & Resurreccion 2011); social values (Albizua & Zografos 2014; Persson et al. 2015; Corner, Markowitz, & Pidgeon 2014; Turhan 2016); community engagement (Bardsley & Rogers 2010; Sheppard et al. 2011; Fresque-Baxter & Armitage 2012); and cultural worldviews (Shi et al. 2015).

From this literature and our research, we identify values, place, power, and narrative as the key pillars of a culture-based understanding of climate change adaptation. At a fundamental level, it is the interplay of these four pillars of culture that underpins the way in which people respond to climate change.

Values

Values are a defining element of culture as they represent the beliefs, worldviews, and understandings of a group of people about what is good or bad, desirable or undesirable, sustainable or unsustainable. The ways in which people in a particular community, group or sub-group make sense of a situation or respond to a message has a lot to do with their values. As O'Brien and Wolf (2010) point out, climate change adaptation policies and practices can only work if they "respond to different values and address potential value conflicts, while creating human security for present and future generations" (p. 240). Arguing that science itself embodies a specific set of values that can run counter to other forms of rationality, Herman (2015), for example, calls for employing science in conjunction with cultural knowledge, specifically indigenous knowledge, when fashioning adaptation strategies.

Place

People have very close relationships with the land, including but not limited to, the land they live and work in. At the heart of designing adaptation policies, therefore, is "place attachment" (Quinn, Lorenzoni & Adger 2015). Communities that have intimate knowledge of their surroundings and are deeply aware of the impacts of climate change on these surroundings are best placed to lead or co-design adaptation strategies (Lewicka 2011; Fresque-Baxter & Armitage 2012).

Power

Central to the management of adaptation processes are the dynamics of power. The often unseen power of imposing solutions assumed to be good for communities is always an issue. For example, traditional ecological knowledge (TEK) is a vast repository of non-Western traditions and ways of doing things that can be very



helpful in understanding and responding to issues faced by communities. However, simply appropriating this knowledge in climate adaptation projects is also tantamount to an abuse of power (Williams & Hardison 2013, p. 542).

Narrative

Stories are an important part of a culture-centred framework. The fast-emerging genre of climate fiction is an example of how stories of climate change can help communities imagine innovative ways of adapting to it. Indeed, "how a community 'stories' its past experiences and actions ultimately determines how it understands and practices future adaptation" (Paschen & Ison 2014, p.1084). Māori communities in Aotearoa have a platform of stories, many of which are being re-imagined for contemporary times (Munshi, Kurian, & Morrison 2019) that signal what the risks of climate change are and how local communities can find the best ways to adapt to changes in their surroundings.

Sketch of a culture-centred framework

In the specific context of climate change adaptation, "inclusive engagement processes that are cognizant of the range of values and needs of different stakeholders and target groups, and acknowledge power dynamics, are more likely to be successful" (Munshi, Kurian, & Morrison 2019, p. 65). It is for this reason that a culture-centred framework for climate adaptation calls for building layers of deliberative engagement with a variety of stakeholders around the four pillars of values, place, power, and narrative. As Munshi, Kurian, and Morrison (2019) point out, "creating robust policies on climate change adaptation demands a synthesis of culture-as-lived-experience with scientific knowledges and an engagement with people from a range of constituencies" (p. 64). This is important because different stakeholders face specific and unique challenges in dealing with climate change and have very different priorities for adaptation. The diagram below is a simple representation of the framework. Although it shows only a linear pathway, the authors recognise there are multiple feedback loops within a system that integrate culture into climate change adaptation processes.



Mātauranga Māori and climate change

Input by Cressida Ririnui (Student working with the project team)

The interplay among values, place, power, and narrative discussed in the culture-centred framework can be seen in Maori approaches to climate change adaptation. Mātauranga Māori is the intergenerational knowledge encompassing Māori perspectives, worldviews and cultural practices, which are used to understand the links between the tangible and the intangible (spiritual and metaphysical). Early Māori settlers gained environmental knowledge through their experiences of interacting with the natural environment. In adjusting to new seasonal patterns and cooler temperatures of New Zealand, Māori had to adapt to a new climate (Hopkins, Campbell-Hunt, Carter, Higham, & Rosin, 2016). A pilot project by NIWA's Maori Research and Development Unit, which documents Maori Environmental Knowledge of climate and weather in New Zealand (King et al. 2008; Manning et al. 2015), showed that Māori community members were aware of imminent environmental events because of their accumulated knowledge of environmental indicators (Manning et al. 2015). Climate variability is not new to Māori. Māori observed weather and climate patterns using environmental indicators (such as tree blooming, bird behaviour and star movement) to govern daily and seasonal activities (King et al. 2008).

Whakapapa or the idea of genealogy develops Māori understanding of climate change because it denotes the link between people and the natural world. Notwithstanding the connection to the land, whakapapa also strengthens relationships with other people which strengthens adaptive capacity (King et al. 2008; King et al. 2010; Tunks 1997). Manning et al. (2015) argue that whakapapa affords Māori communities the opportunity to build "on their relationship with land and water" (p. 591). These relationships are crucial to effectively respond to climate change (King et al. 2010).

A well-known Māori proverb says that 'Māori walk backwards into the future', which can be interpreted to say that Māori walk into the unknown future with thoughts on generations to come, and eyes on generations gone. Unlike Western scientific approaches to climate change, the unique repository of mātauranga Māori knowledge is dependent on context. Māori are traditionally inclined to transmit their knowledge of climate change in an emotive way that often provides details of how it affects their livelihoods:

When we used to go to school then there used to be ice, actual ice on the side of the road, in the puddles. Now you don't see it anymore... Now of course you grow up and you get to eighty and you suddenly realise, oh, the world must be getting warmer (R. Paora cited in King et al. 2008 p. 395.)

Tikanga Māori opens the door to understanding Te Ao Māori and the responsibilities that come with it, such as kaitiakitanga and pūrākau. Tikanga Māori, incorporating Māori traditions, customs and values that are interconnected with daily tasks, often facilitate how Māori interact with the environment. Māori learn from



the environment and have the obligation to pass that knowledge on to others. King et al. (2008) found that there "is considerable potential to gain from long-term Māori experiences with weather and climate" (p. 402).

For many generations, Māori have adopted the role of kaitiaki or guardian. Kaitiakitanga is an essential responsibility to sustain and protect the natural environment, not only to meet the needs of the people of the present, but to guarantee that future generations will also have access to these resources. Multiple studies have expressed the important role of kaitiakitanga in the climate change space (Manning et al. 2015; Schneider, Glavovic, & Farrelly 2017; Kawana 2010) as it is the responsibility of kaitiaki to be proactive in addressing the issue of climate change for the benefit of future generations.

Despite the importance of Māori knowledge in climate change discussions, this knowledge is not adequately drawn upon in policy-making forums or local and regional planning bodies. Engagement with Māori is also limited with information on climate change available to communities often being jargon-filled, which many find difficult to understand. To enable a clear understanding of the issue of climate change and how it will affect Māori, information will need to be relevant and contextual, while also representative of the audience. Already, there is a feeling that climate change adaptation is a lowpriority for Māori communities because they feel that there are more pressing, immediate issues (Schneider et al. 2017; Manning et al. 2015). In one study, Manning et al. (2015) discuss the place-based research of how whānau and hapū at Arowhenua Pā prioritise stresses and difficulties that affect their immediate livelihoods over climate change. Many people are unaware of the climate change signals that exist, despite the readily available scientific evidence (Schneider et al. 2017). One way of raising awareness is for information to be disseminated to communities in a way that is culturally-sensitive because Māori understanding of climate change is often deeply rooted in Māori cultural and spiritual values (Schneider et al. 2017). Although Māori are experienced in climate variability, a better understanding of climate vulnerability and adaptive capacity of whanau, hapū and iwi is needed, and "in many cases new strategies will be needed to ensure the long-term sustainability of different sectors and regions in the context of climate change" (King et al. 2010 p. 109).

Existing social and economic disparities affect the adaptive capacity of Māori. Manning et al. 2015; King et al.2010). The Māori economy is sensitive to climate change because it is largely based in predominantly land- and fisheries-based industries, as well as tourismrelated industries, all of which are climate-sensitive (Manning et al. 2015; King et al. 2010; Packman, Ponter, & Tutua-Nathan 2001; The Royal Society of New Zealand, 2016). Managing the risks associated with such industries would largely "depend on the flexibility of the industry to modify their practices and investments" (The Royal Society of New Zealand 2016 p. 48), as well as Māori innovation, creativity, and traditional knowledge (King et al. 2010).

The poor representation of Māori in the determinants of health make Māori communities vulnerable to the health effects of climate change (Jones et al. 2014). The capacity of Maori to plan for, and respond to, healthrelated effects of climate change is also relative to their limited financial access, vulnerable infrastructure, substandard housing, food security and many more determinants of health (Jones et al. 2014; King et al. 2010; Manning et al. 2015; Meade 2017). Jones et al. (2014) argues that it is critical that public health and equity are positioned at the centre of climate change policy: "climate change policies that raise costs for fuel and energy (and therefore increase costs of goods and services) without counter-balancing measures, could place extra financial burden on low-income families disproportionately Māori" (p. 56).

The coastal regions, which are popular tourism destinations, are, of course, most vulnerable to climate change because of sea level rise and coastal erosion, and it is imperative for communities living and working in these regions can adapt. Adaptation options available include relocation, but this poses a challenge for Māori because of their strong connection to land and sea. A disconnection from their homeland is a barrier to maintaining a strong cultural identity that is distinct to that area. Already, climate-related weather events are threatening the cultural institution of the marae and to ancestral urupā (King et al. 2010). Relocation options that are not thought through could contribute to a loss in cultural capital of communities (Okeroa 2008), and even affect Māori tourism.

A broad survey of the literature on Māori and climate change indicates the importance of developing a culture-centred framework of public engagement on climate change adaptation. It also shows some significant gaps in research, which include identifying and quantifying climate-related risks and hazards for inland Māori communities, specifically assessing the role of maraes in climate-related disasters, and the effects of colonisation on the adaptive capacity of Māori, including addressing the dispossession of Māori land in coastal communities and its effect on Māori cultural identity.

Methods

The report draws on targeted engagement with tourism operators, industry representatives, policy planners and analysts in central and local government institutions, and community organisations, including Māori collectives. The project adopted a multi-method approach including semi-structured interviews, virtual systems mapping and a citizen stakeholder panel, informed in the case of Māori participants by a kaupapa Māori methodology. In addition, the citizen stakeholder panel was shaped by the principles of deliberative engagement that recognise the central importance of deliberation and carefully facilitated exchange of views by participants to arrive at fresh understandings of issues and problems. These principles are a central component of the broader culture centred framework for engagement that is outlined in this report.

Interviews

The research team interviewed 30 people across both North and South Islands of Aotearoa New Zealand on the impacts of climate change on the country with a strong focus on the tourism sector. The interviews, which were carried out face-to-face or via telephone, covered tourism operators, industry representatives, policy planners and analysts in central and local government institutions, and community organisations, including Māori collectives, in Auckland, Christchurch, Queenstown, Thames, Waitomo, and Wellington. The interviews traversed a wide range of issues including specific economic, social, and cultural risks of a rapidly changing climate and the priorities on planning adaptation measures.

Systems Mapping

The findings from the interviews formed the basis for two system mapping sessions with 12 participants from the tourism sector (based in Auckland, the Coromandel Coast, Northland, and Rotorua in the North Island and Queenstown and Nelson in the South Island). These sessions were conducted over the Zoom virtual platform on two different days. The maps emerging from the sessions provided a visual depiction of key actors and organisations that make up and/or influence a system, as well as their relationships to a given issue and to one another. They also helped distil some of the key issues around climate change and tourism and to identify leverage points, opportunities for collaboration, and breakages that could undermine effective achievement of the goals of industry-specific climate adaptation strategies.



Citizen Stakeholder Panel

Following the system mapping sessions, which highlighted climate scientists, government officials, tourism industry executives, and Maori as among the key actors in developing climate adaptation strategies for the tourism sector, the research team organised a national citizen stakeholder panel for representatives of the key actors to engage with tourism professionals and businesspersons (see Appendix). Stakeholder panels, considered to be an effective technique for increasing participation in decision making processes (Kathlene & Martin 1991), typically involves a representative sample of stakeholders engaged in a process of defining the problem, identifying different viewpoints, discussing various options for solutions and developing proposals (Hörning 1999). The session was attended by 32 participants, which included five climate scientists, four industry executives, three government officials, and representatives of a wide range of tourism enterprises from both North and South Islands. In addition, one tourism sector participant signed in via the Zoom virtual platform. About 25% of the participants identified as being of Māori heritage. The panel also provided an opportunity to put into practice the principles of the culture-centred engagement framework which draws on scientific knowledge, lived experience, diverse stakeholders and deliberative processes.

The panel began with presentations by scientists and policy makers on climate change in Aotearoa New

Zealand and its effects on tourism. Participants then discussed initial tourism sector insights obtained from interviews and system mapping sessions. An interactive polling tool helped gather live information on the perspectives of the participants at the citizen stakeholder panel. The Slido software used facilitated real-time responses throughout the proceedings. While not all participants responded to each question, the overall responses formed the basis for preliminary findings (Munshi et al. 2018). Moving into interactive breakout participants brainstormed sessions, adaptation strategies for the tourism sector, including how individual organisations could develop their own specific adaptation efforts. Participants then voted on the strategies using the live polling tool. The citizen stakeholder panel wrapped up with a discussion on strategies for adaptation in the tourism sector and reflections on actions that could be taken as next steps.

Kaupapa Māori Methodology

Given the project's emphasis on culture in designing a public engagement framework on climate adaptation, iwi and hapū perspectives on climate change have been an essential part of the project. Aligning with the Vision Mātauranga themes of mātauranga Māori and Taiao, the project draws on Māori perspectives, and the cultural knowledge traditions these perspectives are grounded in, to incorporate diverse visions of action on climate change. This project engaged with, among others, urban Marae elders, Māori women, and Māori businesspeople





alongside iwi leaders in considering potential impacts on tikanga, including changing practices of tapu noa, rāhui, mauri, weaving, and food gathering, etc. The engagement with Māori participants were based on Kaupapa Māori principles and the project team enlisted the additional support of Kaupapa Māori researchers in the components of the research involving Māori participants.

Deliberative Engagement

Ideas of deliberative engagement derive from the normative project of deliberative democracy that has lent itself to practical application in numerous instances around the world (Baber & Bartlett 2017; Curato et al. 2017). It is a "talk-centric" approach that is based on careful, reasoned deliberation and is fundamentally inclusive of multiple forms of reasoning that has an established record of curbing elite dominance in decision making (Curato et al. 2017, p. 29-31). For Kahane et al. (2013, p. 4-5), the term deliberative refers to "exercises that emphasize:

- Learning through the exchange of perspectives among diverse parties (not one-by-one engagement, not focus groups or polling)
- A problem-solving orientation that wrestles with costs and trade-offs (not just visioning or wish lists, but giving participants a sense of the real choices faced by policymakers)
- The opportunity for participants to explore diverse emotional perspectives and personal experiences in a non-adversarial environment, and, linked to this, willingness to shift position based on new information and arguments (not just horse trading or negotiation)."

These principles of deliberation were deployed in creating and running the citizen stakeholder panel in order to put into practice this element of the culture centred framework that we suggest as part of the wider research project. In the discussion of findings that follows, our research participants have been given alpha-numeric codes to protect their identity, as per the requirements of human research ethics guidelines of the University of Waikato.

Findings

Perspectives on sustainability and climate change adaptation in the tourism sector vary considerably between sector-wide representative organisations and larger enterprises, on the one hand, and smaller tourism operators on the other. Sustainability issues now make a frequent appearance in tourism industry reports and materials. For example, in the last two years, TIA surveys demonstrate that there has been an acknowledgement of the centrality of sustainability to tourism and a recognition of climate change as an important concern for the sector (Smiler 2018; Roberts 2019; Bassett 2019). A 2017 TIA state of the industry report noted that 87% of respondents to their survey indicated support for sustainability issues (Smiler 2018). In addition, some of the many sustainability initiatives in the tourism sector include, for example, the TIA's Sustainability Commitment launched in 2017, which "aims to see every New Zealand tourism business committed to sustainability by 2025 our vision is leading the world in sustainable tourism." The private sector Tourism Holdings Limited's (THL) sustainability report also "shines some light on the environmental and social impacts of our activity as an industry, and for THL as a company." Despite these efforts, it is important to note that many of the tourism industry reports we collected during the period of this research did not engage with the specific issues of climate change either explicitly or deeply. What this suggests, as was evident from our interviews as well, is that climate change and the need to adapt to it is not seen as a distinct issue but instead tends to be subsumed within 'sustainability'.

Interestingly, the latest 2019 Tourism Industry Aotearoa survey, which for the first time included a section on the 'Natural Environment,' reports that a number of tourism businesses are seeking to, or taking, action to measure and understand their carbon footprints (Tourism Industry Aotearoa 2019). In the survey 13.8% respondents strongly agreed that their business "measures and understands its carbon footprint," with 30.8% responding that they 'agreed' (Tourism Industry Aotearoa 2019, p.26). Yet, our interviews with a number of tourism operators showed that climate change as a threat to the industry, and an issue requiring a concerted focus on adaptation, is less well understood and considered, with little evidence of any real understanding of its implications. This contradiction within the tourism industry has been flagged previously (e.g. Hall 2006), and our research indicates that it continues.



There is certainly a huge awareness in New Zealand's tourism sector about the country's natural resources being its greatest asset, evident in its successful showcasing of the 100% Pure brand over the last 20 years. The sector is also aware of the potential impact on the tourism sector of international climate mitigation and emission-reducing policies on people's ability (and/ or willingness) to travel. For example, a Tourism Industry Aotearoa (2016) report on tourism industry growth notes:

With momentum building on global responses to mitigate climate change risks, it is clear that the New Zealand tourism industry can and must develop strategies to ensure it is demonstrably committed to looking after its economic future and the resources it uses to operate. (p.16)

Despite this recognition, there is significant uncertainty in the sector about both the specific impacts of climate change and what the sector might do immediately to prepare for these impacts. However, alongside the sense of uncertainty, the sector is also trying to make sense of the challenges and opportunities of running a business in a future, climate-changed world. In the next section we talk about some of the themes that emerged from our research.

Engaging with four themes

Four major themes emerged from our data from interviews, mapping sessions, and the citizen stakeholder panel, to form a picture of how the tourism industry is approaching climate impacts and the need for adaptation. These themes revolve around risk and uncertainty, short-term considerations, challenges for the sector, and opportunities in the face of such challenges.

Risk and uncertainty

The ambivalence within the tourism sector towards climate change reflects an inadequate grasp of the risks facing the sector and the uncertainty around what the impacts would be like, and where. This is evident in the quote below from a tourism business owner:

What's causing that, is that a cycle that happens every thousand years? We probably can't answer that. Well, some scientists may have that information, but let's not again get too caught up on the detail. Let's actually understand first what the quick ones will be. (C-3)

The citizen stakeholder panel we organised on climate change adaptation in the tourism sector attracted people with an obvious interest in issues around climate change and tourism, and, consequently, the levels of concern expressed by participants were much higher than the levels expressed at the interview stage. But even among this largely aware group, only about half (53 per cent) of the citizen stakeholder panel participants said they were "very concerned about climate change." Of the remaining, 44 per cent chose to opt for the generic "concerned" category, and 3 per cent declared no concern at all. Uncertainty was a major issue for the citizen stakeholder panel:

- About 60% of the participants said that they had a high level of uncertainty about climate change generally, and
- Over 55% of participants felt a high degree of uncertainty regarding the impact of climate change on their specific tourism business or sector.

Many interviewees, however, felt that there was little risk of climate change impacting the tourism industry specifically. There was a perception that only "repeat customers" would notice changes in the landscape but that this was "never going to be a thing that would stop anyone coming" (Z-2). The perceived lack of tangible impacts in the immediate sense contributed to the feeling that climate change was something mostly discussed in the "longer distance" (A-1). Only with reference to the ski industry, which was seen as being vulnerable due to its reliance on snowfall and stable seasons, was there an exception. But even this exception had an optimistic ring around it:

I've even spoken to customers who have been to the glaciers a few years ago and been surprised at how much it has retreated. I don't think it would, it's never going to be a thing that would stop anyone coming I don't think. (Z-2)





For the risk to be tangible, some believed that there would have to be more drastic climate change impacts occurring now before these issues emerged on the radar of those in the tourism industry. For others in the sector, the solution to protecting the sustainable image of New Zealand was to build stronger infrastructure that would help the country absorb the growing numbers of tourists, while acknowledging the absence of planning to prioritise such investments:

So, you've got this beautiful environment, let's protect that. That's what sustainability is to me. How do we do that? We just need to make sure we ... provide the infrastructure, which we can't keep up with the rate of tourism. We can't obviously support the numbers by building the infrastructure fast enough. So, what can we do? (C-3)

The predominant focus of the tourism industry is on the here and now, leaving the seemingly more amorphous risks of climate change to others. Given the current demand for flights, there is little appetite in the sector to acknowledge that adaptation planning needs to anticipate the potential for large reductions in visitor numbers. Although the citizen stakeholder panel did refer to carbon offsetting for flights, a key message missing was the central importance of climate mitigation and adaptation to the long-term survival of the industry. As one climate change expert we spoke to remarked "there will soon be no serious tourism business that is not a carbon neutral business" (N-1). The need to understand risk from a long-term perspective, and with an eye to the welfare of future generations, was highlighted by a Rotorua-based cultural tourism consultant:

We're looking out to 50+ years as to what the climate might be – we're looking at forestry risk, now with fires - the whole sense of thinking is changing and adapting our agriculture, horticulture, plant industry... So, when I think of the impact of temperature ... it changes our thinking around use of our land and resources - and (consider) more friendly ways that allow us to reduce the amount of our carbon emissions and reduce the amount of nitrogen leaching, and that type of thing and then being able to tell those stories in a tourism context... we have the caring about future legacies and of course from a Māori perspective we end up planning for our children and our mokopuna. (SB-1m)

Such a long-term perspective on preparing to adapt to climate change is, however, largely missing in the conversations in the tourism sector because of the constraints of everyday business needs.

Short-term considerations

One of the challenges for the tourism sector is that it is made up of a large number of small and medium businesses that do not have the financial resources for infrastructure development or any form of longer-term planning. As one interviewee put it, "many of the tourism operators don't see themselves as either primarily responsible for, or even in any position to affect the outcomes for the environment" (C-2b). Another stated that taking up adaptation measures is beyond the capacity of small businesses whose primary focus is "finding a defined experience and delivering really well on that" (A-1). This line of thinking ties in with the general attitude of thinking about today rather than about tomorrow in the earlier section.

Already, a large section of the tourism sector believes that tourism operators are essentially environmentally friendly and have a strong conservation ethic:

Tourism businesses have generally given back to the environment, often sort of under the radar but because our tourism proposition in New Zealand is built on the environment, our tourism operators are generally environmentalists and conservationists. (X-1)

However, there appears to be little recognition that work on environmental protection in a broader sense is not the same as responding to climate change. Tourism's dependence on the natural environment, in fact, often means that conservation work by tourism operators in many ways coincides with their short term business imperatives.

The short-term focus of many businesses is a challenge for local government, which is trying to deal with issues of infrastructure development. As a local government official says,

In an industry like tourism it's cut throat, they simply will take advantage of the council if they think they can bring in fifty hotel rooms and more tourist buses and more business to the downtown bakeries and stores and what not ... but adaptation is probably one of the further issues from their mind. (X-2).

There is, thus, not much of a sense of urgency in the tourism sector to begin to adapt to a changing climate. As one tourism marketing professional said, other than in some ski fields, very little was occurring in the realm of climate change adaptation:

Apart from perhaps the ski areas, I'm not aware of anybody, any businesses in tourism, actually kind of adapting their business yet or doing anything different, planning anything differently because of this awareness of climate change. And I guess that's probably a horizon thing for most tourism businesses. (Z-1)

One of the reasons for the industry's inability to look at the distant horizon is the prioritising of the here and now. Under-resourced to undertake large-scale infrastructure-related adaptation initiatives, most of the smaller businesses rely on the government to do the planning and spending. A South Island water-based tourism operator was quite candid in his views:

I am researching into electric boats at the moment (but) have to fund (my)self – it would be a lot easier if (there was) a mechanism to assist (us) in moving in those directions – electrification of your fleet. In the long term it will actually be cheaper to (run). A lot easier if there is a mechanism to assist tourism businesses with dealing with these challenges. (S-4j)

Challenges

Engaging with tourism sector professionals and business owner-operators with a degree of interest in climate change issues at the two system mapping sessions and the citizen stakeholder panel helped identify a number of specific challenges that the sector faced from rapidly advancing climate change. Among the broader ones were:

- Lack of a nationwide climate change adaptation strategy for the tourism sector.
- Lack of widespread awareness and knowledge in the tourism sector of climate change impacts.
- Reluctance to face the reality of the science of climate change.



- Lack of coordinating mechanisms to address and adapt to climate change.
- Lack of centralised funding mechanisms to address and adapt to climate change.
- High cost of building infrastructure to protect against climate-induced events.
- Uncertainty about where long-term investments are needed.

In more specific terms, there were concerns about a number of potential threats to tourism ventures including:

- The risk of warmer temperatures leading to the advent of tropical and sub-tropical creatures (e.g, disease-carrying mosquitoes); threat to the lives of native flora and fauna; and damaging the environment for outdoor adventures.
- Unstable mountain conditions due to decreased snow, affecting tracks and walkways.
- Damaged beaches and iconic scenery.
- Unpredictable weather leading to cancellation of tourist activities.
- Flooding in caves and other tourist locations.
- Inability or reluctance of tourists to travel to New Zealand because of the distance.

Perceived opportunities

Despite acknowledging the threats of climate change, many in the industry remain upbeat about quite literally "weathering the storm." Interestingly, quite a few of the interviewees from the New Zealand tourism sector actually see growth opportunities from climate change. A tourism executive seemed to capture the essence of the thinking:

I see the predictions that we're going to have essentially a wetter west coast and a drier east coast. Well, drier (drought) is bad for farmers but drier is a good selling point for tourism. Not that anyone in tourism wants climate change, and warming of the planet but it could have some benefits. (X-1)

Similarly, a water-based tourism operator was optimistic about warmer waters attracting more tourists to water activities: "With increasing water temperatures, people will find it easier to be in the water and this is an opportunity for us to increase awareness of the marine environment" (S-4j). A tourism professional from the North Island (S-2s) felt that warmer temperatures could also lengthen the tourist season in the country, boosting business.

There is also a perception that although the retreating glaciers have diminished the guided walks that tourists



Photo by Ruven Cretney - Million 6, South Island Toman

have traditionally used to get to Fox or Franz Josef, the tourism business overall has not been affected because there has been a boost in the high-end helicopter tourism to the alpine region: "The helicopter companies are booming. They're doing very well, because if you really want a glacier experience you've got to go in a helicopter" (X-1). There is little recognition of the increasing carbon intensity of such adaptive responses to climate change.

Participants at the citizen stakeholder panel were more grounded in their views on the opportunities provided by climate adaptation measures. Many of them felt that focusing on climate change was an opportunity for innovation and thinking of the future in terms of sustainability. One of the significant opportunities was in the realm of cultural tourism, a goal that could be achieved by integrating cultural indigenous thinking in long-term tourism development planning. The cultural aspect was also highlighted by some who saw opportunities emerging in terms of sharing stories around the impacts of climate change and "why we've had to adapt, why we're changing, what we can do to participate in it." (A-1). Other opportunities expressed through a number of responses at the panel and the mapping sessions included the renewal of infrastructure to adapt to climate change and the opening up of cross-industry (e.g., dairy and tourism) collaboration to address climate change.



Local government responses

The tourism sector's engagement with the question of climate change adaptation has been sporadic, as evident from our interviews. This has at least partly been because, as a local government official commented, "many of the tourism operators don't see themselves as either primarily responsible, or in even any position to affect the outcomes – for the environment." (C-2b) Instead, responsibility for climate change adaptation is widely seen to be necessarily determined by national and local government action.

Interviews with regional and local government officials revealed a number of challenges that currently come in the way of appropriate responses to climate change. The absence of a climate change national policy statement, and inadequate and piecemeal central government response [as of 2017], were flagged by several local government officials as an issue of concern. "The RMA does not mention climate change. So, the question is what's the advice, what's the policy, what's the regulatory approach – and so there are quite a lot of gaps there" (C-1). Similarly, the seemingly arbitrary separation between mitigation and adaptation, with Regional Councils being responsible for adaptation and local authorities for mitigation, was questioned as being counter-productive and constraining.

There was also recognition of the critical importance of decision making and planning on infrastructure that was cognizant of climate change realities, and frustration that there was little power and control, including access to funding, that could be exercised by local government on these issues.

Where the Local Government – and this is across New Zealand – has failed is getting its hands on the big levers of your infrastructure and finance strategy ...We've got to look at all our networks and the challenges and opportunities that arise through on a number of fronts – not just operational and capital expenditure around renewals ... but also around existential threats [of climate change]. And we haven't, in New Zealand – being blunt – really recognized or tried to dig deep into what that means for us in terms of investing. (C-2a)

Infrastructure development is of particular significance in thinking about managing tourism. One official elaborated on the impacts of excessive tourist numbers for small places such as Akaroa, near Christchurch:

You've got this ... lovely French, quaint village of Akaroa, which is built for tourism - it's now

been voted the cruise ship destination of the year – and you've got masses heading into there. We don't have the infrastructure sorted, we don't have the road infrastructure, and we never even talk about the climate change impacts. The dumping at sea of the waste – because of course that goes out to sea – the lack of policy this country has around that - that's another piece that's completely silent, as far as I'm concerned. It is free-market economics because it's not very heavily regulated – and yet we fish it, we use it for dumping, we use it as transport corridors. And, if planes can't fly, for whatever reason – climate change or otherwise - then we'll probably depend on shipping. But, we're not regulating our shipping for a climate change future either. (C-1)

Despite these challenges, there are a number of initiatives that local governments around the country have embarked on. For example, a number of NZ cities have signed up to the Global Covenant of Mayors for Climate and Energy, an international network of cities. Such a commitment has been translated into action through land use planning by local councils, for example, by keeping climate change impacts of sea level rise and flooding at the centre of infrastructure design, as in the case of Christchurch.

Alongside such adaptation efforts at the local level, which indirectly can shape the tourist experience, there is also the work done by the Department of Conservation to manage the realities of intensifying tourism. Their dual role as both custodians of the conservation estate and responsible for visitor experience has seen them develop "a deliberate strategy to keep some places very accessible … and keep other places as not difficult to access but they keep that back-country experience." (C-2b)

At a time when tourism enterprises are looking to the central and local governments for guidance on adapting to climate change, a number of local councils in New Zealand, including ones in Auckland, Christchurch, and Wellington, are beginning to declare climate emergencies to marshal action on addressing climate change. In a statement, the Auckland mayor said that "by unanimously voting to declare a climate emergency we are signalling the council's intention to put climate change at the front and centre of our decision making" (Our Auckland 2019). It remains to be seen if the declaring of an emergency will lead to significant strategic steps on climate adaptation in the tourism sector. Meanwhile, however, there are tourism-oriented parts of the country where the local council and climate action groups do not see eye to eye (see text box below).

Local scale community adaptation efforts in Thames

Thames is a small township on the Hauraki Plains south of Auckland that is a gateway to the tourist hotspots of the Coromandel Peninsula and its spectacular beaches. The area is already facing issues from rising sea levels and storm surges in low lying areas, resulting in damage to homes and traditional land. Other predicted risks from climate change include floods and droughts with resulting impacts on farming and fisheries. From a tourism perspective, extreme weather events affect access to the peninsula, while the presence of increasing numbers of tourists bring not only economic benefits but also demands on energy and road infrastructure and increased carbon emissions from cars.

There is a section of the community that is proud of the unique character of the place: "In terms of our culture, I think we have a very creative and vibrant arts and heritage-oriented community" (T-1). Significant lobbying from local groups, including young people, has thrust the issue of climate change into the spotlight for Thames. This has particularly been an issue when the local council voted to not sign the 'Local Government Leaders Climate Declaration'. In refusing to sign the declaration, the Mayor of the Thames Coromandel District Council has described the declaration as "politically charged and motivated" (Gudsell 2019).

Climate action groups in the region, however, feel that the local government has neglected to address the threat of climate change to the environmentallysensitive area. A member of an action group said: My interest has been ... in actually looking at what works out on the ground and what I've discovered is while we have these policies and while there are national guidelines and all sorts of reports and help available, they're not being put into practice by the local authorities, you know. So in essence this issue just isn't getting the attention it should. (T-2)

While there is a dedicated group of community members who are passionate about climate issues, several participants reported that many people in the region don't know or realise how climate change will impact the place. A café owner in the region said that only a small, select group of people were engaged with issues around climate change: "There's a perception in the community that it's the hippies and the alternatives, as the people who are embracing change. A lot of people go-oh-um that's not for me" (T-5). The same interviewee said that public engagement on climate change and its impact on a tourist location was not adequate with talks, workshops, and social media outreach only attracting a small number of people in the community. Much more diverse forms of delivery are required to "develop a new level of thinking" in the community (T-5).

The general "lack of knowledge about risk" was a significant challenge across all climate impacts including hazards such as those facing "coastal areas... fire risk, drought and slips, heavy rainfall and floods" (T-2). There was a perception that the community might



see climate change as more of a problem following a significant event. "I think if they are the recipients or victims of what climate change has delivered... there will be a much wider acceptance", a research participant (T-3) said.

With the split in the community between those who are actively involved in climate issues and those who are perhaps more apathetic about the risks, there is also the added confusion around areas of local and central government responsibility. Participants active in the local community were frustrated with a lack of action by the local government but also with the lack of clear central government directives:

The problem is the central government has left it up to local government and they've basically issued some quidance which is now nine years out of date, they haven't updated it and they've said 'Ok, it's over to you... We need a law which says if you are considering a resource consent, we can't allow major infrastructure or resource consents on land which is only half a metre above sea level rise, which has been happening. So, the key for me is still leaving some element of local decision-making, but far more direction from central government. Because local councils are very small, they have a small ratepayer base – they don't have a lot of money and so they need changes in the law, but they also need funding from government to carry out these jobs. It's not going to work if central government just foists all these issues onto local government. (T-2)

The Thames case study illustrates the complex political and social dynamics that enable and limit adaptation pathways. Perceptions and knowledge of risks are highlighted as an important factor in altering perceptions about climate change. But there are also significant limitations for communities working for adaptation strategies in political contexts that are not supportive of the need for urgent responses to climate change.

A Māori community member in the region called for a balance between economic and environmental imperatives and suggested that adopting the principles of eco-tourism would be a good way to adapt to climate change:

We don't want motels and hotels and all that... we're looking at eco-friendly opportunities for the region because we don't want any risks. In our valley we have one of the last bands of virgin kauri up there. It's probably a good walk to get up to them, but we know we don't want tens of thousands of people up there because of ...all sorts of impacts you know ... We thought about it, as a community as a tribe that's not what we want. To find us business opportunities that are consistent with our value on our whenua, it's actually low impact stuff. We want people to be able to get up and see the kauri and the beautiful natives, waterfalls, the old kauri mining dams and kauri dams. We want people to be able to get to there, but not in huge numbers that will negatively impact on the area. (TM-2)



Photo by Ivan Sanford on Unsplash - Pauanui Inlet, Coromandel

Stories of change and adaptation in Waitomo

Waitomo is home to caving tourism experiences that stretch back over a hundred years. In the 1880s local Maori first opened the caves to visitors. However, the land and caves were confiscated by the colonial government in the early 20th century for tourism and 'scenery preservation' (Cleaver 2011). This was later found to be a breach of the Treaty of Waitangi in a 1990 settlement which restored ownership of some land blocks as well as awarding compensation and a portion of profits from the licence for tourism businesses. The licence was later bought by Tourism Holdings Ltd in 1996 (Cleaver 2011). Our interviews with people in the local community showed that sustainable tourism ventures in the area are driven, for some, by an interconnected view of the environment, community and economic livelihoods.

In relation to climate change, one participant said that while the community is "environmentally concerned", the issue of climate change doesn't resonate as much with the inland community as it does for those on the coast. An inland-based participant echoed this by saying:

Yes, it's very much a coastal thought process at the moment, there's no real understanding of what will happen in the future. As a farmer, we're probably more worried about what the weather conditions will be like, how do we become more resilient to those conditions? (W-5)

There were many in the local community who didn't feel that climate change would impact on them specifically. In this case, the people we spoke to from the inland community in Waitomo largely saw climate change as an issue most relevant to coastal areas. However, those involved in farming in the region were concerned about the risks and impacts, particularly from changing weather patterns.

Marokopa is a small coastal settlement in the Waitomo region. Unlike inland communities that are not directly threatened by sea level rise, the Marokopa community is already facing the impact of rising water levels. This is particularly an issue for the local marae which is only accessible via barge and is at risk from flooding and sea level rise (Day 2018). As narrated by one participant:

And then with the storms it's coming up to where our marae, our tupuna whare, where it's actually standing now. So even the village will be in danger.

The change in sea levels and king tides now mean that there are difficulties in bringing people back to the marae even for tangi: "because we have to cross the river to get to our marae, what we have found is that when we have loved ones who have passed away, we can't take them back to our marae because of the rising water... [in the last] 18 months, three of our whānau had passed away and we couldn't take them back to our marae. (WM-1)

Māori have been part of the Waitomo landscape for generations and indeed are the owners and guardians of one of the country's best known tourist spots, the Waitomo Caves, which is operated by a private tourism company. According to the history of the caves, a local Māori chief Tane Tinorau had discovered them in the 19th century and many of his descendants still work as guides (http://www.waitomo-caves.com/ about-waitomo-caves/Waitomo-caves-history/). Susceptible to changing atmospheric conditions, the caves are monitored for levels of carbon dioxide (CO2) released into the subterranean passages by the estimated half a million tourists who visit the attraction. In fact, in recent years, the caves have had to be closed several times because of potentially damaging CO2 levels in the fragile atmosphere inhabited by glow worms (Gudsell 2017). Rising levels in the underground waterways have also been a concern. As one of the guides says: "We have noticed frequent flooding, heavy rainfall affects the river which affects our operations in the caves... Rising levels affect how we operate our boat rides". (WM-3)

So far, the tourism operators at Waitomo have managed the environmental risks to the caves quite responsibly. However, residents in the area who are involved in ancillary tourism activities say they do not have enough information about the impacts of climate change:

(We need) probably solid information about the consequences – I suppose of temperature change. People are conscious there is temperature change, sea level rise – there's evidence we might become wetter or drier or we might have more storms and I think (there is a need for) more information about those impacts – I mean if we are going to be much drier, do people need to start building de-facto water supplies; if we're going to be much wetter, do we need to get more roadable land? We don't have enough information about those impacts – we don't have certainty about those impacts either. (W-4)

For Māori communities, however, the information is all encompassed in traditional knowledge. Māori elders can instinctively sense the changing climate. As a kuia in the Waitomo region says: In my lifetime I have seen the rising of the moana. There's nothing we can do about it – of course there's nothing we can do about it because that's nature. The rising of the sea... well (it impacts) our river. It's tidal and so in certain times of the year when we have high tides and spring tides it actually ends up by covering a great deal of the land. In my lifetime I have seen the water just keep rising – that's global warming, but also it's the whole world. (WM-1a)

A Māori guide at Waitomo says that Māori have always used sustainable practices in their daily lives and it would be good to educate tourists about those practices. "I think tourism is about storytelling and introducing those stories relevant to Te Āo Māori and Papa and Rangi is one way in which you can educate people about the environment and kaitiakitanga" (WM-3). The same guide talks about using traditional knowledge to preserve the caves: "One thing I would like to pursue is re planting over the top of (the caves). We have had a lot of trees removed and we have the big gum trees but we need to put the native plants back in. That will help with filtering the water into the cave and keeping the cave cool" (WM-3).

Māori communities also call for more effective public engagement by officials and scientists with local businesses and small operators on climate change. One elder says that it is not enough to "just write an article in the paper and hope that everyone will read it, or listen to it on the [radio]. Some of the language is incomprehensible for a lot of people. I think they have to be more demonstrative and engaging" (WM-2). The Waitomo case study demonstrates the complexities of engagement on climate change adaptation. Different communities experience climate change impacts in different ways, and hold different ideas about climate change risk, weather and environmental issues. Communities within the same region are also facing very different pressures regarding climate impacts. These dynamics clearly demonstrate the need for context and place specific adaptation strategies in facing future climate impacts and risk. The Maori values evident in the interviews with Maori community elders are explored further in a study on Māori tourism businesses in the text box below.



Culture and climate change adaptation: A study of futureproofing Māori tourism businesses

By Crystal Tawhai (Based on her Masters study carried out as part of the larger project)

He mihi nui ki ngā kairangahau mō tō koutou whaakaro ki tēnei rangahau! Nau te raurau, nāku te raurau, ka ora ai te Iwi! Ngā manaakitanga kia koe me to whānau, hapū Iwi!

Māori have engaged in tourism since the early 19th century, where they first welcomed overseas visitors to the hot springs in Rotorua. Today, there are many Māori tourism businesses across New Zealand, from the Far North to Stewart Island, with a variety of offerings for visitors to experience the Māori world. Some of those offerings include land and water based guided tours, hangi and marae visits, arts and crafts, retail outlets, transportation providers, accommodation and concerts (NZ Māori Tourism 2019). Māori tourism businesses range in size, mainly small-medium sized enterprises, and they are a platform for Māori to share and preserve their culture, share their connection with the natural world and to create a prosperous future for their local communities (NZ Māori Tourism 2019).

Climate change is a major risk for Māori tourism businesses because it threatens Māori ways of life and culture, and places of spiritual significance to Māori (NIWA 2016). It will require Māori communities to adapt to climate change by developing new strategies to ensure long-term sustainability of communities and activities (NIWA 2016). But how prepared are Māori tourism enterprises in adapting to climate change, future-proofing their businesses, and safeguarding their cultural values?

Culture is at the heart of Māori tourism. Culture encompasses "the symbols that express meaning, including, beliefs, rituals, art and stories that create collective outlooks and behaviours, and from which strategies to respond to problems are devised and implemented" (Adger, Barnett, Brown, Marshall & O'Brien 2012, p.1). Adger, et al., (2014) go on to state that culture is often tied to "places (physical spaces which are given meaning by people" (p. 1) and that climate change impacts in places may lead to significant loss due to changes in culture and communities.

Mātauranga Māori, a knowledge system developed over many years through transmission of knowledge through generations, includes all aspects of knowledge, including, "values, beliefs, methods, technology and practices" as cited in Harmsworth & Awatere (2013, p. 275). Overtime, mātauranga Māori has further expanded to include more knowledge forms, including local and indigenous knowledge. Indigenous knowledge is people and place specific, accumulated over generations and sets the direction for Indigenous societies in their interaction with their environments (Nakashima, Rubis & Krupnik 2018). In the context of global climate change, there is a significant interest in the perspectives and knowledge of Indigenous peoples; however, there is more work which needs to be done to understand and meet the concerns of Indigenous peoples (Nakashima, Rubis & Krupnik 2018). Specific to Māori and climate change adaptation is what is called Māori Ecological Knowledge. According to Carter (2019), Māori Ecological Knowledge (MEK) is defined as "Iwispecific knowledge for managing relationships" (p. 26). Through MEK, Iwi share traditional stories with each generation about their ancestors' teachings and actions. MEK also outlines the significance of place, reaffirms one's identity attached to place and kaitiakitanga responsibilities are an important component of MEK (Carter 2019). Māori values underpin Māori-centred tourism with Maori tourism businesses aiming to protect and develop their Māori tourism products on their own terms (McIntosh, Zygadlo & Matunga 2004).

Given the inextricable links between land and identity and the strong association between nature and culture among Māori, tourism businesses run by Māori communities are particularly susceptible to the impacts and implications of climate change. This study focussed on three Māori tourism businesses. Two of the businesses are North Island-based whānau-owned enterprises, one on Kāpiti Island and the other in Napier. The third is a hapū-owned business located in Kaikōura in the South Island.

Kaipakihi Tuatahi

Kaipakihi tuatahi is an eco-cultural Māori tourism business, which fuses hunting-gathering and Māori cuisine. The business, offering a unique cultural experience for tourists, journeying through their ancestral mountains, lands, waters, and history, was founded out of the owners' community work on environmental protection and restoration in the Hawkes Bay. The owners/managers of the business both have an educational background in science and undertake scientific research monitoring projects for their Tūtaekurī river tribes, focusing on the holistic health of the local ecosystem. They also grow native trees that can flourish in dry summers and study fish and shellfish health and abundance in the Ahuriri Estuary. Despite their deep commitment to environmental restoration and sustainability, climate change is not a predominant concern for this business. Kaipakihi tuatahi owners say that they are aware of climate change impacts in their region, including the potential for extreme weather events, but they do not think climate change will affect their business in the short-term. The business is prepared to respond to environmental changes but has not planned for climate change adaptation at this point due to their uncertainty about the specific nature of climate impacts. Four key themes emerged from the interviews with Kaipakihi tuatahi:

1) Immediate priorities and sustainability

In discussing their work on enhancing the environment within their region, the owners of Kaipakihi tuatahi stated that one of their immediate priorities is working with their hapū and local council to restore their awa – Tūtaekurī – for which they co-produced the enhancement plan in collaboration with the hapū groups of the awa. They wanted to address the causes of environmental degradation and work to restore the river environment. The owners recognized the longterm impacts of climate change, such as sea-level rise on their region, but believed that sea-level rise would not impact on their business viability in the shortterm. They saw climate change as present but slow in its progression, which influenced their preparedness to adapt.

2) The importance of combining science and tikanga Māori

Kaipakihi tuatahi uses scientific knowledge and tikanga in their environmental protection projects and they combine these two knowledge systems to communicate environmental care and protection to their communities. Science is integral to this business and without science, the owners cannot understand different phenomena within their natural environment. At the same time, tikanga is important to them as without tikanga, they cannot effectively communicate to their local communities solutions for caring for their environment. This has significant implications for understanding the importance of combining culture and science for climate change adaptation strategies.

The business talked about how applying both knowledge systems prepares them to understand environmental impacts and phenomena. When asked if science and knowledge of the environment from a Te Ao Māori perspective complemented each other when responding to environmental and climate change impacts, the owners said:

The knowledge of and interface between both Tikanga Māori and contemporary science is incredibly valuable as it enables us to more readily understand our natural world.

The owners of the business use their knowledge of science and tikanga as a tool to communicate with their local communities, referring to impacts based on science and their effects on Māori gods, as below:

Ngā Hapū o Tūtaekurī have inherited a landscape from our tīpuna that has been heavily modified, and shaped, to a point that the current land coverage and land use activities will bear little similarities to the native forests, and abundant and diverse ecosystems that previously sustained our tīpuna living on the banks of the Tūtaekurī awa. Pastoral grass cover, residential and industrial developments, horticulture cropping, and plantation forestry have replaced the previously flourishing native flora and fauna that blanketed Papatūānuku. The environmental effect of this shift from a natural indigenous ecosystem to an anthropogenic shaped landscape has served to remove the blanket of native vegetation that bound and retained soil and sediments on the land, and that also captured, stored, utilised and filtered the tears that fell from Ranginui.

This passage provides insight into the significance of the business owners being able to share their knowledge with their communities. The literature on climate change adaptation and culture talks about the need to consider culture in order to design & implement strategies that meet the needs of different societies and groups within them (Adger, Quinn, Lorenzoni, Murphy & Sweeney 2012).

3) Kaitiakitanga underpins the businesses operations

Kaipakihi tuatahi's business is underpinned by kaitiakitanga, which involves protection of their environment and educating their international visitors and communities about guardianship of nature. In sharing some insights on how they inculcate in tourists a sense of care for the natural environment, they say:

The final key thing we do is to engage our international visitors in our world view of kaitiakitanga. At the conclusion of our tours we plant a native tree alongside our river or on top of our mountain. The purpose of this is to show them a glimpse of how we as Māori value and practically care for our natural environment." The idea being is that they'll take this Māori way of viewing the natural world, i.e. kaitiakitanga, and implement and share those philosophies back in their community."

Kaitiakitanga is more than a value for this business, they also consider it to be a role and responsibility. Their business is set up in a way in which their business activities teaches others about the value of kaitiakitanga:

4) Partnerships and policy

Partnerships are important to Kaipakihi tuatahi to successfully carry out their environmental initiatives. They currently partner with schools and the city council in a variety of ways. Partnering with local council is significant given that the regional council are responsible for including climate change adaptation into their land and water management plans (Carter, 2019). This study indicates that there is a need for a formalised partnership between the owner's hapū and local council in order to help restore the mauri (life force) of their awa. The business believes there is lack of good policy to help improve their awa, which has degraded over a long period of time:

Our plan aimed to target what we saw as deficiencies and/or absence of science and good policy that was needed to improve our Awa.

Kaipakihi Tuarua

Kaipakihi tuarua is a national and international awardwinning New Zealand nature-based tourism business committed to sustainable tourism. It operates all yearround and is owned and operated by the indigenous Ngāti Kuri people of Kaikoura. The business started out of the local marae in response to economic decline in the area, particularly amongst Māori in the community. The business believes that their ancestor the whale 'paikea' was the answer to their problems, and so, they have been offering tours since 1987. The business recognises that as a Māori-owned enterprise, they have a responsibility to take care of their visitors and the natural world, and operates with the five Māori values of manaakitanga, tino rangatiratanga, Iwi whanui, kaitiakitanga and whakapapa. Their aims include minimising waste, promoting recycling, using eco-friendly products, reducing energy consumption and carbon footprint, and minimising their impact on marine life. Their commitment to sustainability is shown in their annually agreed strategic objectives and departmental targets within their business plan, which are regularly reviewed and monitored for effectiveness.

The business works with scientists and keeps up with scientific journals to learn how to protect whales and their environment. As a result, they have taken a number of actions: they use jet propulsion units on their vessels to minimise noise, they contribute financially for research to be carried out in the area on whales, dolphins and seals and they are a member of the Tiaki Promise. The Tiaki Promise is a commitment in the tourism industry to encourage visitors to care for people and place. The company's tour guides give a talk about the Tiaki promise at the start of each of their tours.

There are three significant events the business has identified which has tested their resilience and strengthened their ability to adapt to environmental challenges. The first is related to the difficult times the Kaikōura community has faced leading up to the establishment of the business, the 2007-2008 global financial crisis and the Kaikoura Earthquake of 2016. The complexities of the 7.8 magnitude 2016 earthquake, described as the most complex earthquake ever studied, has led to discussions about the uncertainties of climate change. However, the business has bounced back after each event, pushed them to adapt to changes and seek new opportunities. The themes that emerged from the interviews with the owner-operators of Kaipakihi tuatahi are discussed below:

1) Uncertainties and opportunities

Kaipakihi tuarua operates within a complex environment as Kaikoura has been responding to environmental challenges for some time, particularly "the Christchurch earthquakes of 2010 and 2011 (which) had a massive impact on tourist flows to Kaikōura, forcing the business to adapt again." Other challenges include pressures on infrastructure with an influx of visitors over time and the earthquake in 2016. The last earthquake created certain environmental changes such as seabed rise.

The care of marine life care has been a priority for the business since they started, and the businesses finds it "hard to flesh out climate change impacts versus the earthquake." Post-quake Kaipakihi tuarua did not operate for 49 days and the earthquake tested the business's resilience. However, hard-work and the willingness to adapt across the business has led to higher economic gains and a new marina, which was built in less time than planned and better than the one they originally had. The business is also in the process of building a new boat and a new hotel on the waterfront, to meet the high demands of customers. They said their immediate focus postquake was their staff and whānau. They said they were not prepared for the 2016 earthquake but they are much more resilient now with experience

Kaipakihi tuarua has given much thought to whether the business needed to change any of its current sustainability efforts in order to adapt to climate change. The business is prepared to adapt to any changes in their environment, including climatic changes, in order to uphold their values and in turn, taking care of their communities-including visitors, their lands seas and marine life. They said "we are looking for ways to do better for sustainability, right across our business."

2) A Māori values lens for understanding science

Kaipakihi tuarua consistently talked about applying a Māori lens when reading scientific journals about marine life. They also talked about how the science helps them to be more sustainable and adapt to impacts of the earthquake. Alongside studying science, the business upholds its Māori values, as stated below:

Because we're a Māori-owned company, we hold onto those values, so when we're reading anything scientific, we interpret, for instance, we moved our motors from what they were when we first set up, to Hamilton jet units, as a result of reading scientific journals, about the noise that motors produce under water ...so we'd do this naturally based on the values we hold. We're always on the lookout for how we do things better, as a result of the damage of the quake, we will need to look at our building here and what we do about it.

3) Māori values underpin the businesses' commitment to sustainability

The five specific Māori values that underpin Kaipakihi tuatahi's offerings are customer – manaakitanga, company – tino rangatiratanga, community – iwi whānui, kaitiakitanga – conservation and culture –whakapapa. These values drive the business's work as an ecotourism enterprise and guide its philosophy of protecting the environment and caring for visitors. Whilst the business is unsure about the impacts of climate change, they confirm that their values help them to strive to always do better. It is these values that helped the business to create opportunities in response to the earthquake. For example, the business discusses how kaitiakitanga leads them to business practices which help in protecting their ancestor, the whale. They also see kaitiakitanga and manaakitanga as interconnected:

Because the whale is an ancestor, we would never do anything to harm them such as put sewage or grey matter from boats direct into the ocean...because that's where they live...We are always visitors to the world of the whales and respect it as such.

As Kaipakihi tuarua is a Māori-owned company, they have obligations to their visitors, environment and ecosystems, which demonstrates how manaakitanga and kaitiakitanga are interconnected.

As a Māori-owned company, our business cherishes the twin values of hospitality to visitors and reverence for the natural world. It is a philosophy that embraces people, the land, the sea and all living things as one.

Leadership for environmental protection is a key feature of this business. In line with the value of Tino rangatiratanga, it educates visitors on caring for the environment, teaches them about the Tiaki Promise, and invites them to plant trees in order to reduce carbon emissions. Committed not only to minimising their own carbon footprint, the business teaches their visitors and communities on how to do this.

The values of Whakapapa and Iwi whanui come through

in the way in which the business shares the history of their area and their ancestor Paikea with their visitors:

Our business was formed in 1987 at a time when Māori were casualties of Kaikōura's declining economy. At this time of difficulty, Ngāti Kuri leaders like believed the local Sperm Whales held the answer to the unemployment problems of the Māori community. They knew their ancestor Paikea had journeyed to a new life in New Zealand on the back of the whale Tohorā. It seemed appropriate for Paikea's descendants to again ride on the back of the whale to a new life and prosperity.

This cultural insight is important for understanding how this business adapts to different challenges and how they would eventually respond to climate challenges. They have referred to Paikea for providing them with answers to unemployment problems of the Māori community and they have referred to their whānau as important to consider, when disasters have struck.

Kaipakihi Tuatoru

Kaipakihi tuatoru is an internationally renowned, small whānau-owned and operated, sanctuary for New Zealand flora and fauna on Kāpiti Island. It offers a range of services, including tours where visitors can get up close to the kiwi, ferry transport to access the island and accommodation. The island is home to a number of native birds such as the Kererū (wood pigeon), Tui and Weka. The marine life at the sanctuary includes dolphins, orca and seals. The whanau has lived on the island since pre-Māori settlement times, and through the times of whaling and conservation development, which started in the early 1900s. Kaipakihi tuatoru operates on Māori land on the island although most of the island is owned by the crown and managed by the Department of Conservation. Tourism New Zealand have referred to the business as one Aotearoa needs more of - that is, low-impact, nature eco-tourism, delivered from a whanau base.

Like Kaipakihi tuatahi and tuarua, this business is aware of climate change and is committed to sustainability as an eco-tourism business but is not entirely sure of impacts on their business and whenua. It is important to mention that the owner of Kaipakihi tuatoru has an interest in the development of the tourism sector, in Aotearoa as well as globally, for Indigenous peoples. This is a competing priority in the face of climate change. Like Kaipakihi tuatahi and Kaipakihi tuarua, this business is vulnerable on several counts and works on building resilience. When asked if it had identified any climate change impacts to its whenua, Kaipakihi tuatoru said that:

In the last five years, it has become far more noticeable, the extremities, particularly the impacts of a harsher summer. For example, less water, more intense heat, impacts the flora, impacts bird nesting, impacts the kai on the ground for insects & other species. Given that the peak operational season for the business is the summer, the quote above indicates that the business's taonga and key business activities are at risk as a result of harsher summer. Does the business have any strategies to address the issue? Their response:

We are experiencing season change, our winters for example, the months of settled weather have extended a bit. That has had an impact on the length of our season. We were operating in June a few years ago, we are now operating into September.

Kaipakihi tuatoru has identified opportunities to extend their season based on weather conditions. They explained some of the opportunities and challenges that come with climate change such as "heavier rain and the challenge of collecting and storing it":

We have had to implement additional measures – water intake from stream source, additional piping and groundworks for additional storage. Our lengthened and lengthening seasons require a two-phased approach: (1) More collection and storage and (2) More managed usage and conservation.

Although the business is prepared to adapt to climate change, there can also be tensions which can impact on the business's development, as outlined in the themes below.

1) Collaboration

Kaipakihi tuatoru collaborates with the Department of Conservation (DOC) to carry out responsibilities on the island, as there are "management plans for weed, pest, biosecurity, fire management, which cross over onto whānau land." However, there can also be some disagreements between DOC and the business:

"we do collaborate with DOC, but we have our disagreements, as they have a mandate which does not always align with what our whānau's responsibilities on our land."

Similar to Kaipakihi tuatahi, this business depends on relationships with a central government agency to operate their business, and make some decisions which relate to environmental protection of their land. As mentioned earlier, an important finding about this business is that they have a focus on "tourism development in their own way." This aligns with Ringham, Simmonds and Johnston's (2016) observation that Māori tourism businesses create new spaces that contest colonial and capitalist values. In the context of climate change, King, Penny & Serverne, (2010) emphasise the diversity of Māori society and how there are various factors which determine how prepared different groups within Māori society are to adapt to climate change. For Kaipakihi tuatoru, sharing their part of the land in their region with DOC – who manage a significant proportion of the crown-owned land, can lead to the business being restricted to practicing their cultural responsibilities as kaitiaki:

there can be disagreements of a cultural nature...on one hand DOC also consult the business for advice of a cultural nature. The historical context also plays a part in where the business is currently placed for their development and making decisions about climate change, due to land confiscations in the past, there is much less land in whānauownership.

2) Cultural values

Kaipakihi tuatoru's business model is bolstered by Māori values: "Our business is kaupapa-based, our principles guide everything-mitigating and minimising risk." This business has been protecting flora and fauna in Kāpiti for generations, with Māori values guiding their efforts. They are aware there are risks that come with operating a tourism business and they use their kaupapa to mitigate risks." Furthermore, they said that because of the nature of their work with the species on the island, they have to be adaptive. Applying a kaupapa approach helps with this as "there can't be a tick box exercise when protecting flora and fauna, for example you cannot manage Tui breeding cycles, but we aim to minimise the risk, by applying those kaupapa.

Similar to the other two businesses, Kaipakihi tuatoru believes in sharing knowledge with their visitors through their business, including their conservation work and they also run holiday programmes for children. Furthermore, they refer to the value of their ukaipotanga (homestead) in the following:

It's a part of us, it's what we call our Ukaipotanga (home, source of sustenance), it's where we get our strength from, it's where we get our reason for being is because of our attachment to that place."

This recognition of the business and their whānau's attachment highlights what Adger, Quinn, Lorenzoni, Murphy & Sweeney (2012) refer to as considering attachment to place in climate change adaptation policies for fair climate justice.

Summary

In summary, all three businesses are deeply committed to being kaitiaki for their whenua and showing manaakitanga for their visitors. The businesses are prepared to adapt to environmental changes and have been caring for and enhancing their lands and ecosystems for generations. In addition, Māori values underpin their environmental and business activities. Climate change is on each of the business's agenda at different levels and there are various reasons as to why the businesses are not currently adequately prepared for climate change adaptation. The reasons include differing priorities and challenges and a need for knowledge of climate change impacts and adaptation. On the other hand, the businesses are identifying some opportunities as a result of environmental challenges and in some cases, climate change. There are also intersections between scientific knowledge and traditional knowledge in dealing with issues of climate change and the businesses show that they are proactive in their approach to environmental protection through their cultural values and a culture of mitigation across the wider tourism sector.

There were similar views about climate change amongst the businesses, in terms of what climate change impacts are and the pace of those impacts. As in the study by Hopkins et al. (2016) on the ski industry that found the general perception amongst participants was that the effects of climate change are distanced and gradual, the businesses in this research felt that extreme weather events are related to climate change impacts but were not sure of the specifics. These findings showed that each business manages various priorities, including their day-to-day business activities, interacting with the values of different partners and various environmental initiatives, involving restoration of their natural environment and protection of their species, from native birds to marine life. On one hand, this focus is implicit within their business models and they are practising their role as kaitiaki. On the other hand, the priorities are also impacted by environmental degradation by human activities. The climate change matrix for Māori society discusses how Maori at different levels of society will be impacted by climate change, i.e., at the business, household and Iwi level (King, Penny & Serverne 2010). The findings of this research show that the businesses aim to carry out environmental activities or respond to climate change within the scope of their current knowledge, which impacts at the whānau, iwi and business level.



Insights

Although tourism is a key industry in New Zealand, there is no clear strategy in place to future proof the industry in the face of advancing climate change. The tourism sector is riding high on booming tourist numbers but is struggling to cope with inadequate infrastructure, made worse by the destruction of existing infrastructure due to severe weather-related disasters. Our findings suggest that many in the industry, while aware of the risks and challenges climate change poses to the industry at a general level, are unable to prioritise climate change adaptation. Undertaking adaptation can only happen if there is an underlying understanding of the context, risk and science of climate change (Lawrence et al. 2016).

Our research shows that a key component for understanding the contexts of and pathways to climate adaptation is culture. A focus on culture, therefore, is a crucial part of bringing together diverse stakeholders and different types of knowledge to pursue adaptation processes effectively. A culture-centred framework of public engagement on climate change adaptation, built on the pillars of values, place, power, and narrative, outlined in the report can be a useful guide for such processes. As such, through this project, we undertook a citizen stakeholder panel that utilised a deliberative process in order to bring together stakeholders from diverse perspectives in a manner that discussions on experiences, priorities and values around climate adaptation in the tourism sector between different stakeholders.

From our interview data, for many in the tourism sector, the default setting is to prioritise economic values and focus on short term economic concerns - profits and business survival, for example. Some in the industry expressed a strong commitment to sustainability, but recognise the challenges of faced by a carbon intensive sector that depends on long haul aviation and fossil fuel-intensive transport internally for tourists to experience the cherished landscapes of this country. The primary focus on economic values, however, means that that in an already high carbon world, the tourism sector responds to the challenges of disappearing glaciers in the South Island by opening up new ventures of helicopter tourism - never mind that this too cannot last very long and contributes to the problem of increasing emissions. In contrast, there is an alternative vision of a tourism - one that is committed to carbon neutrality by taking up very different ways of 'doing tourism' in a climate changed world.

Juxtaposed with the material values are the strong cultural values expressed in particular by Māori communities, many of who rely on traditional knowledge for sustenance of life on earth. According to Māori understandings of the world, humans and nature are intertwined and there are strong relationships – indeed kinship – among people, animals, plants, rivers, mountains and lakes. As Munshi, Kurian, & Morrison (2019) point out:





Māori trace their whakapapa or genealogy to the mountain and river of the place they are from, seeing themselves as inextricably part of the earth, which shapes their kaitiaki relationship with nature. Their role as guardians is interwoven, in turn, with the notion of whanaungatanga – people's relationships with whanau (encompassing their family and community, and all living things). Indeed, the idea of whanau or extended family captures the sense of multi-generational networks of people and other species with whom we are intimately connected. Mauri (life force) represents the integrity of all things in nature. (p. 70)

Restoring the *mauri* of rivers, mountains, or land damaged or harmed by human activity (indeed anthropogenic climate change) is, therefore, a fundamental responsibility of people (Morrison & Vaioleti 2012).

There was unanimity among participants that for tourists a key element of a unique New Zealand experience is to appreciate the beauty of its landscape. The narratives of 'place' evokes not only a physical space, but the social and cultural connections with the natural world. The centrality of these landscapes – the experience of rugged wilderness, mountains, snow, rivers, and lakes – to tourism is such that there is little overt recognition amongst tourism operators that these may be rapidly changing. But even where such recognition exists, it is clear that the power to make changes – such as key infrastructure investment decisions, policy frameworks that make climate change central to decision making processes, and financial priorities to reflect climate risks and responses – rests with government.

From a public engagement point of view, narratives of climate change, incorporating the challenges and the ways of adapting to such change, is critical. While dense reports and data sheets are important sources of information, they don't penetrate the minds and imaginations of people. In this regard, Māori communities in several parts of the country are reaching out to people by focusing on stories of the past and, increasingly, on retelling of old stories to reflect newer contexts (see e.g. Munshi, Kurian, & Morrison 2019).

The inadequacy of current policy settings and legislation, and the need for central government leadership alongside adequate resourcing of local government, were key themes that emerged from our interviews. Our interviews also revealed the widely disparate commitments of different local government bodies to climate change adaptation. In Thames, despite a vocal plea for climate action from significant sections of the community, including school children who have petitioned the council and mayor, there has been a steadfast refusal to sign the Local Government Climate Declaration or commit to any kind of action. Developing a culture-centred framework of public engagement requires a commitment to deliberative practices. The significance of deliberative democratic approaches is particularly critical in a context where citizens and other stakeholders, despite at least a basic level of awareness of the risks of climate change, have often chosen not to challenge the status quo (see e.g. Leining & White 2015) – at least partly because other, more immediate priorities and concerns serve as distractions. One promising way to address this indifference or unwillingness to countenance real systemic change is through deliberative processes that have been shown to increase support for policy action on issues such as climate change (Barrett, Wyman & Schatten 2012; Baber & Bartlett 2018).

As Baber and Bartlett (2018) state, "Deliberative democratic practices are especially well suited to the challenges of environmental governance, particularly under conditions associated with the Anthropocene" (np). Its focus on participation, inclusion and reciprocity makes it open to all forms of knowledge, including local knowledge, and is most likely to have just policy outcomes (Baber & Bartlett 2018; see also Niemeyer 2014). This commitment to deliberative democratic approaches underpinned the use of various methodologies for public engagement in this project. Notably, the various forms of public engagement acknowledged the lived experiences of diverse stakeholders, allowed a free interplay of scientific and indigenous knowledge, facilitated deliberative engagement among different groups of people and multiple sources of knowledge, and ultimately led to the shaping and communicating of diverse and contextual strategies for climate change adaptation. The citizen stakeholder panel held as part of this research provided valuable insights into these diverse experiences and the value of deliberative engagement by shedding light on the views of those engaged with climate adaptation in the industry. The panel process fed insights into the research findings while also providing an opportunity to create space for a culture-centred engagement approach to adaptation discussions in the industry.



Conclusion

The tourism sector in New Zealand is becoming increasingly cognisant about issues of sustainability and is actively working towards achieving sustainability goals. However, the sector has not yet fully grappled with the challenges of advancing climate change and is not adequately prepared to proactively adapt to the consequences of a changing climate.

Despite the vulnerability of an island nation to the threats of climate change, the tourism sector recognises the potential impacts of climate change but does not fully see the need to adapt as an issue of *immediate* concern. Caught up with the here and now of a booming, high foreign exchange-earning, tourism economy, many in the sector either neglect or defer thinking about the consequences of climate change for another time. There is, of course, universal acknowledgement of the country's scenic natural landscapes and resources as being its greatest tourism magnet, but thinking about how to adapt to a context when such assets are compromised by a changing climate, is not yet a priority. Some, in fact, continue to be optimistic about the durability of natural icons.

An active engagement with the tourism sector revealed a broad picture of how the tourism industry is approaching climate impacts with discussions clustered around risk and uncertainty, short-term considerations, challenges of climate change, and opportunities in the face of these challenges. A large measure of the ambivalent attitude within the tourism sector towards climate change is the uncertainty around what the impacts would be like, and where. Many felt that the risks were not fully tangible at this stage. A lack of systematic risk assessment from a long-term perspective has allowed the tourism sector to fall back into the default setting of short-term considerations. One of the challenges for the sector is that it is made up of a large number of small and medium businesses that do not have the resources for infrastructure development or any form of longer-term planning. Taking up adaptation measures is, therefore, beyond the financial capacity of most tourism businesses. It is not surprising, therefore, that businesses expect building frameworks for climate change adaptation to be the responsibility of the government.

A lack of a nationwide climate change adaptation strategy for tourism is indeed one of the specific challenges for the tourism sector in adapting to climate change. Among the other broader challenges are a reluctance among many in the sector to face the reality of the science of climate change, an absence of centralised funding as well as coordinating mechanisms for the sector to address and adapt to climate change, and the high cost of building infrastructure to protect against climate-induced events.

There is also a need to spread greater awareness in the tourism sector about the very real threats to tourism such as the risks to flora and fauna from higher temperatures, unstable mountain conditions, damaged beaches and iconic scenery, unpredictable weather patterns such as unseasonal flooding, droughts, and storms, forcing cancellations of tourist activities, and most of all, the potential inability or reluctance of tourists to travel to New Zealand in the future. The need for such awareness is all the more important as many in the sector are complacent and remain upbeat about large numbers of tourists continuing to arrive in the country, and some rather naively believing that climate ravages elsewhere could drive tourists to New Zealand.

In sum, while tourism is a key industry in New Zealand, there is no clear strategy in place to future proof the industry in the face of advancing climate change. There is a significant lack of knowledge about the impacts of climate change on tourism, which comes in the way of dealing with the issue with a sense of urgency. Undertaking adaptation can only happen if there is a deep understanding of the science of climate change and the specific contextual challenges faced by tourism businesses based in different geographical locations and undertaking different activities. Research carried out in this project affirms that culture is a key component for understanding climate adaptation and that a focus on culture is key to bringing together diverse stakeholders and different types of knowledge to pursue adaptation processes effectively.

We identify values, place, power, and narrative as the key pillars of a culture-based understanding of climate change adaptation. The interplay of the four pillars of culture underpins the way in which people respond to climate change. For many in the tourism sector, we observe the prioritisation of economic values and a desire to focus on short term economic concerns profits and business survival, for example. Juxtaposed with the material values are the strong cultural values expressed in particular by Māori communities, many of who rely on traditional knowledge for sustenance of life on earth. According to Maori understandings of the world, humans and nature are intertwined and there are strong relationships - indeed kinship - among people, animals, plants, rivers, mountains and lakes. Similarly, place is a key cultural construct as is evident in the centrality of landscapes in the domain of tourism in New Zealand. The notion of power is reflected in how certain actors make infrastructure investment decisions and influence policy frameworks on the priorities of the tourism sector. Finally, from a public engagement point

of view, narratives of climate change, incorporating the challenges and the ways of adapting to such change, is critical. One promising way to apply a culturecentred framework to bring about real systemic change is through deliberative processes that can increase support for policy action on issues such as climate change.

In line with these conclusions, we offer a set of recommendations for both policy makers and tourism sector professional and operators below. These recommendations are derived from our interview and research data, as well as the outcomes of the citizen stakeholder panel which provided a culture-centred deliberative and collaborative process for working on adaptation issues. As these recommendations emerge from our data and the collaborative process they are indicative of a broad approach that draws on direction from central and local government and industry, collaboration, communication, as well as processes for measuring and evaluating progress.

Recommendations for Policy Makers

- Investigate the development of a national strategy for climate change adaptation in the tourism sector. In addition, there is a need for place specific and co-designed strategies at a regional scale that are developed alongside the tourism sector, local communities, iwi and hapū. These strategies need to consider regionally targeted knowledge building and specifically include a focus on the importance of Māori knowledge and values in underpinning adaptation strategies.
- 2) Increase and strengthen the communication of climate change data and information in order to contribute to awareness of adaptation needs in the tourism sector and the design and implementation of adaptation plans.

Recommendations for Tourism Professionals and Operators

- 1) Incorporate climate change adaptation explicitly into NZ Tourism Sustainability Commitment within the industry.
- 2) Include climate change adaptation into Framework for Sustainable Growth for Tourism in the Future.
- 3) Investigate different adaptation strategies for a diverse range and scale of tourism operations, including diversifying experiences, education for tourists, promoting cultural tourism, and collaborating with iwi and local communities.

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Appendix:

The research team organised a citizen stakeholder panel session at the Cliftons Convention Centre on 100 Willis Street, Wellington, on Friday, 9 November 2018, as part of the larger research project. The session was attended by 32 participants, which included five climate scientists, four Tourism Industry Aotearoa (TIA) executives, three government officials, and representatives of a wide range of tourism enterprises from both North and South Islands. In addition, one tourism sector participant signed in via the Zoom virtual platform. About 25% of the participants identified as being of Māori heritage.

The panel began with presentations by scientists and policy makers on climate change in Aotearoa New Zealand and its effects on tourism. Participants then discussed initial tourism sector insights obtained from interviews and system mapping sessions. Based on information, conversations, deliberations, and expression of priorities at the session, the research team published a report with a set of preliminary recommendations (see Munshi, D., Kurian, P., Morrison, S., Kathlene, L., Cretney, R., & Doo, M. (2018). Climate Change Adaptation in the Aotearoa New Zealand Tourism Sector: Report of a Cross-Sector Engagement Session . Hamilton: University of Waikato). These recommendations are listed below:

	Recommendation	Actions	
1.	Government should provide political and policy leadership on climate change adaptation for the tourism sector	Action 1:	Set up a steering group comprising climate policy experts, climate scientists, tourism industry representatives, iwi/community leaders, and academic researchers to develop a climate change adaptation strategy specifically for the tourism sector in New Zealand.
		Action 2:	Regularly review legislation, policies and regulations relating to the tourism sector and amend existing ones/enact new ones, where necessary, to facilitate adaptation, innovation, and change in the sector.
		Action 3:	Identify funding mechanisms to facilitate climate adaptation in tourism, including upgrading tourism infrastructure with climate change in mind.
		Action 4:	Actively involve Māori in coordinated action on climate change adaptation based on insights from Te Ao Māori.
		Action 5:	Look at issues of climate change mitigation and adaptation holistically in planning new tourism initiatives for the country.
2.	Tourism sector should develop deeper understanding of the challenges and opportunities for the sector in a climate changed world	Action 6:	Industry leaders should set up cross-sector networks for businesses to work together on sustainability initiatives that specifically identify risks and incorporate climate change adaptation measures.
		Action 7:	Diversify visitor experiences including a sharper focus on cultural tourism alongside landscape tourism.
		Action 8:	Move away from traditional seasonal patterns for tourism planning to more flexible and resilient patterns of planning.
		Action 9:	Look beyond immediate and short-term goals to plan for the future.
		Action 10:	Build an environment of innovative thinking, including virtual tourism possibilities, to make New Zealand a world leader in climate-sensitive tourism.
3.	Climate change researchers should facilitate knowledge-policy-tourism interface	Action 11:	Create climate change scenarios using climate science data to allow development of appropriate adaptation strategies for the tourism sector.
		Action 12:	Translate climate projections data into adaptation action plans.
		Action 13:	Work with indigenous insights into climate change issues alongside scientific data.
		Action 14:	Involve the tourism sector in co-designing research projects.

