He Pou a Rangi
Climate Change Commission

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Te Taitokerau/Northland case study themes summary

Te Taitokerau/Northland faces many climate hazards, and communities are frequently impacted by extreme weather events

Te Taitokerau/Northland's geography, long and narrow topography, and sub-tropical climate make it vulnerable to climate change in several different ways. In many areas, the effects of climate change are already having an impact.

The region is exposed to weather systems from the tropics, including cyclones and other lesser storm systems. We heard that the intensity and frequency of climate change impacts from coastal erosion and inundation, sea level rise, and extreme weather events are already having significant impacts on the population, and that these are increasing.

Cyclone Hale hit the North Island of Aotearoa New Zealand in January 2023, bringing up to 300mm of rainfall in 24 hours and gusts of 128 km/hour in some parts of the region. Then, in February of 2023, Cyclone Gabrielle brought extreme wind and rainfall, with the Te Taitokerau/Northland region receiving 342 mm of rain over seven days. Wind speeds reached gusts of 154 km/hour.

Extreme weather events are projected to become more frequent and intense in the region. How events unfold, and how communities experience the impacts of them, will vary. We felt a strong sense across the groups we spoke to of the importance and urgency of adapting to the changing climate. We also heard that the specific challenges, and therefore the nature of urgent adaptation needed, will vary across the region.

For example, we heard that under investment in infrastructure means that Hokianga is already more affected by the impacts of extreme weather events than other parts of the region. Exposed and vulnerable infrastructure means that extreme weather events can lead to communities being cut off, affecting access to essential services. The population across the region is projected to increase significantly, which will also affect the extent and impacts of climate change in the future.

An increasingly volatile climate makes adapting hard

Te Taitokerau/Northland already has a varied climate, with warm summer weather, heavy rains and intense storms all occurring frequently. Contrasting weather patterns, such as flipping between drought and intense rainfall, are happening, and create challenges. This kind of volatility is difficult to forecast and prepare for.

We heard from one local grower that historically a "bad year" for horticulture operations would be expected to occur one year in seven, but that now the reverse is often experienced – with one "good year" for every seven.

We heard about some adaptation initiatives underway to reduce the impacts of volatility. This includes methods for artificial pollination to enable kiwifruit to be grown in varying conditions. This approach is expensive and requires considerable effort (as the pollen is frozen and hand applied) but has been used because bees cannot fly well in the rain – noting that the intensity and frequency of rainfall is projected to increase. Some growers are also diversifying their crops in response to climate changes and variability (see below).

We also heard about the need to adapt the types of pasture animals graze on as the climate changes. Widely used ryegrass pasture struggles to grow on days above 25°C. With hot days becoming more frequent, ryegrass-based pastures may no longer be a sustainable choice for many Te Taitokerau/Northland pastures.

These shifts present a learning opportunity. Te Taitokerau/Northland's experience could offer valuable insights for other regions. For example, it could help other regions to anticipate and adjust pasture composition as part of their adaptation strategies.

Personal circumstances, including poverty, limit people's capacity to adapt

Personal circumstances and social conditions can make communities or individuals more likely to experience harm when they are affected by a climate-related hazard and can affect their ability to cope and adapt. This can create challenges in the region, where pockets of need vary widely.

Circumstances such as poverty, lack of employment opportunities, underlying health issues, and isolation can exacerbate the impacts of climate hazards. Climate change makes life harder and more dangerous for people dealing with pressing social and economic issues and can add to existing problems like food insecurity and water scarcity. People living in poverty also have limited choices when managing climate impacts and adapting to them.

This leads to discrepancies in the ability of various communities across the region to deal with the impacts of climate change, which will ultimately lead to inequitable adaptive outcomes in the decades to come. Climate change impacts will continue to exacerbate social and economic inequalities throughout the region.

The interactions between poverty, isolation and climate change were strong themes in our discussions in Te Taitokerau/Northland, including with community representatives, councilors and business owners. We heard that many of those facing the brunt of climate extremes in the region are already experiencing disadvantages and living in isolated communities.

In some areas access to necessities, such as warm, dry and safe housing, potable water and reliable electricity, is already low, and is likely to be further compromised by climate change. There are large discrepancies in access to services, infrastructure, and resources across the region. Some communities are already facing constant pressures on their wellbeing and livelihoods, and this is likely to be further compounded by climate change and its impacts.

Emergency responses do not last and there is a need for sustained support over the long term

There is a need to ensure more support for long-term recovery after an extreme event, and for the system to become more proactive. We heard that Te Taitokerau/Northland's emergency responses are generally effective in the short term, managed by Civil Defence in coordination with councils. However, it was noted that after the initial response there is a lack of ongoing support and assistance

for getting back to 'business as usual'. This includes a lack of resources to rebuild, and there was a sense that more focus needs to put on 'building back better'.

Civil Defence Emergency Management works with local councils during emergencies. This collaboration tends to provide effective immediate response, but there is no mandate for further action, or to continue to support long-term recovery once the emergency response phase is over. This is a structural barrier that may get in the way of longer-term resilience initiatives.

We heard that there is a need for a clear plan to increase resilience in the region over the long term. Investing in alternative roading routes, power infrastructure that can withstand extremes, and an ability to build stronger when maintenance activities are undertaken were noted as potential key components of such a plan. The need for an alternate route to the Brynderwyn Hills – which is often affected by landslides, road collapses, and extreme weather – was raised frequently.

Infrastructure is inadequate and prone to collapse in extreme weather

The vulnerability of the Te Taitokerau/Northland's infrastructure was raised frequently by many of the people and groups we spoke to. Water, food supply, roading, power and digital infrastructure are often severely impacted by extreme events. At the same time, we heard that the region's infrastructure has faced chronic under-investment and under-maintenance.

Infrastructure can be difficult to build and maintain due to the region's isolation, geography, and topography. This also creates challenges for repairing damaged infrastructure. We heard that there are several points of failure, including loss of access to power when the infrastructure is damaged.

We heard examples of a lack of telecommunications infrastructure along parts of State Highway 1. Where this is the case, it is difficult to communicate that communities are impacted, require assistance, and to ensure loved ones are okay. We also heard about the impacts collapsed infrastructure can have on the regional economy. For example, Te Taitokerau/Northland's economy lost $1 million per day for everyday State Highway 1 over the Brynderwyn Hills was shut because of Cyclone Gabrielle.

Concerns were expressed to us about the resilience of private infrastructure, such as water storage and irrigation systems. For example, around the Maungatapere area, growers have made long-term investments in a local water irrigation scheme to provide water security. It was noted that this is expensive to run, requires private investment, and the infrastructure is ageing.

We heard from Ngāti Wai, an east coast iwi, that they are seeking permission to become more self-reliant by maintaining their own infrastructure with skilled local workers. This would mean they can repair the infrastructure that supplies locals sooner than they are now, because they rely on out-of-town engineers.

Communities and councils have identified solutions and opportunities for collaboration

We heard about a range of examples of work already underway to adapt to the impacts of climate change. The Te Tai Tokerau Climate Adaptation Strategy was adopted by councils and tangata whenua representatives in April of 2022. It has established community-led adaptation pilots, some of which are progressing well – such as the Ōakura coastal catchment pilot, see below. One of the pilots has been paused, based on a vote by the Kaipara District Council.

Northland Regional Council also has a '*Climate resilient communities fund'*. Community organisations can apply for up to $40,000 plus GST for activities which build resilience.

Many communities have identified local solutions to the climate-related issues they are facing, which reflect their aspirations and values. We heard this, and felt the emotion that fuels action, during a wananga at the Manea Cultural Centre. Community-led adaptation presents opportunities to weave community and council action together to achieve multiple outcomes, create synergies and draw on strengths.

Another important theme we heard is around the role that marae play as key centres for resilience and recovery during extreme events. We heard this, for example, when we met with Ngāti Wai, who provide a hub for locals when extremes hit and people are unable to access the goods and services they need.

We also heard that social connection is important to foster community resilience, particularly for isolated communities. However, we also heard that communities need support to act, including greater access to funding and other resources. Greater clarity is also needed around roles and responsibilities. When roles and responsibilities are unclear, resilience is affected. We heard that this is something the Government could assist with – perhaps through a mandate to drive well-planned, meaningful resilience action.

As mentioned above, many communities are already facing challenges to meet basic needs. This leaves limited capacity to focus effort on planning for the impacts of climate change.

Hapū and iwi are taking action and using ao Māori and tikanga-based approaches

Hapū and iwi groups are taking action through a tikanga-based, hāpori-centric approach. We heard that great progress is being made, but that such action does not always fit together easily alongside councils' priorities and approaches.

Through our conversations with Ngāti Wai, locals at the Manea Cultural Centre, the Joint Climate Change Adaptation Committee, and the North Hokianga Community Resilience Group, we heard about the urgent need to adapt to climate impacts, and they discussed that their adaptation approaches include action through mātauranga. We heard how climate change is exacerbating social and economic conditions, and that mātauranga-based approaches can be challenging to line up with council responsibilities and priorities.

Collaboration is occurring in some places through adaptation pilot projects funded by councils and led by communities. The first community-led adaptation project is a collaboration between Ngāti Wai and Whangārei District Council. Ngāti Wai talked to us about the risks they are facing in their rohe, including floods, drought, coastal erosion, and inundation. Their coastal adaptation project involves moving taonga away from the coast and rivers, protecting sites of cultural significance, and increasing the security of water supply.

Climate change is having an impact on kaimoana, and this is affecting peoples' livelihoods, cultural connection and subsistence

Kaimoana (seafood) is a key food source in the region, with many people depending on the availability of fish and shellfish – alongside other locally grown food. We heard that fish and shellfish are a popular and important food source, with high cultural, economic and nutritional importance.

In some areas some species of kaimoana are becoming less available due to increased pests and habitats becoming degraded. Climate change exacerbates these impacts, as warmer waters bring new pests, creating more competition in their ecosystem.

As one example of this, we heard about a new phenomenon in Ōakura referred to as “floating pipi”. This is when sea rimu (which is increasing as the water warms) attaches to pipi beads and makes them float when the tide comes in – this has resulted in a reduced population of pipi.

The paua population has also significantly reduced over time. Climate change has caused ocean acidification (which affects shell growth) and warmer ocean temperatures, which affect paua survival.

The changing climate presents challenges, like new pests…

We heard that more and new pests are having an increasing impact on local ocean ecosystems. As the climate warms, more pests can survive and thrive in Aotearoa New Zealand environments, outcompeting native species and adding additional pressure to vulnerable ocean ecosystem.

One example is the long spine kina in Te Taitokerau/Northland’s waters. These can create barrens (areas where organisms are depleted except for kina). Populations of long-spine kina have dramatically increased through Aotearoa New Zealand waters. Overfishing has caused the predators that eat kina, like crayfish, to decrease. This means the kina can thrive, compounded by the increase in water temperatures. Kina over-grazing can, in turn, cause considerable damage to kelp forest ecosystems.

We also heard about damage being caused by caulpera, a type of exotic seaweed that can spread rapidly and cause significant damage to ocean ecosystems. Caulerpa arrives on boat anchors and competes with other species for space, upsetting the balance of local ecosystems. This is the case in some Te Taitokerau/Northland waters, with a large cluster in Te Rāwhiti.

Pests are also a problem for other types of ecosystems, and we heard from growers that a proactive response to pests is needed. For example, the brown marmorated stink bug presents a big biosecurity risk for growers nationally. Only ~20% of imported containers get intercepted, so the risk is high. We heard concerns regarding regulations, for example the Agricultural Compounds and Veterinary Medicines Act 1997. Growers noted that it is a barrier to accessing chemicals to eliminate pests due to the time it takes for required chemicals to be certified.

We also heard concerns about *Pinus radiata*. We heard about the impacts wilding pines can have on landscapes and ecosystems. While the spread of wilding pines is not necessarily driven by climate change, a significant response is required when wilding pines catch fire – and this risk is compounded by the warming climate.

… and the changing climate brings opportunities, like new crops

We heard that climate change also presents new opportunities in the region. Agriculture and horticulture are a significant part of the regional economy, and we heard that trials for new crops are happening in Te Taitokerau/Northland, including coffee beans, bananas, and dragon fruit, cocoa for chocolate, and peanuts. We understand that these trials are still in early stages.

Another example we heard about was the migration of kaimoana, such as marlin. With warming waters, species that enjoy warmer climates are migrating to Te Taitokerau/Northland year-round, meaning that there is more available food source. Marlin could be found in these waters in the warmer months previously.

We heard optimism that there are opportunities to increase economic production in the region, with the potential to create new jobs in industries such as agriculture, horticulture and tourism. However, it may be a challenge to ensure that opportunities translate into economic benefit for communities across the region.