

# Reimagining Community Resilience through a Te Ao Māori Worldview

*E.D. Dunlop, M. Boston, M. Owen*

The University of Waikato, School of Engineering, Hamilton, New Zealand.

## ABSTRACT

Efforts to improve community resilience have seen universal efforts to grow capabilities in disaster management for the built environment. Although comprehensive frameworks exist, the perspective used to derive these frameworks fails to address marginalised communities' vulnerabilities, including the Indigenous Māori people. Colonization and socio-economic deprivation on Māori mean community response frameworks fail to reflect their values and specific needs when preparing and responding to natural disasters.

The nature of Māori culture and values presents an opportunity to reimagine the scope of community resilience for an inclusive framework. The Māori history has resilient practices weaved into the very fabric of their culture, which knowledge has survived through the oral transmission of waiata, whakataukī, whakairo, and pūrākau. The practice of community resilience amongst ancient Māori was not consigned to singular events but instead is a holistic perspective bound to their manner of living. Sourcing and qualifying this information from people aligned and immersed in nature is the knowledge required to improve the frameworks to respond to natural disasters while expanding the literature on community resilience.

A comprehensive analysis of traditional Māori resilience is conducted by evaluating a variety of Mātauranga Māori that relate to the resilient nature of Māori, specifically Ngāti Toa. This information is compared to modern Māori perspectives of community resilience using a derived earthquake scenario for the local Iwi Ngāti Toa, located in the city of Porirua within the Wellington region. This information will expand the definition of community resilience and improve disaster response frameworks to be more inclusive, safe, sustainable, and resilient.

## 1 INTRODUCTION

Extensive research has been conducted to ensure comprehensive community resilience frameworks are created to meet the needs of a community and reduce the related risks of their vulnerabilities. However, these frameworks fail to address the vulnerabilities of marginalized communities (like the Indigenous Māori people) and provide equitable solutions to help them participate (Saja et al., 2018). The current frameworks derived for Māori fail to reflect their values and specific needs when responding to natural disasters, but more importantly fail to provide the tools required for them to actively participate by neglecting their level of capability and existing perspectives of resilience. Therefore, marginalized groups (who are often ill-prepared for disasters) living in resilient communities remain in a state of vulnerability and are unable to adequately prepare for disasters as the existing frameworks are neither equitable nor inclusive (Rendon et al., 2021). To begin understanding how best to accommodate vulnerable groups within communities and provide equitable community resilience frameworks, consulting with those vulnerable groups is key (Norris et al., 2008).

## 1.1 Research Methodology

The research methods were adopted for this study and were conducted in accordance with tikanga Māori and Kaupapa Māori methodology – research by Māori, for Māori and with Māori, using an actioned based participatory research method (Taute et al., 2019). The lead researcher is of Māori descent who is immersed in his culture. The knowledge associated with this is integrated into this research through the researchers lived experience. This factor contributed to the research methodology of wānanga (traditional style meeting and discussions) and korero kanohi-ki-te-kanohi (face to face talk at home). The Wānanga was held at the Te Rūnanga O Toa Rangatira head office, and kōrero were held at the homes of kaumatua.

### 1.1.1 Disaster Wānanga and Pōwhiri

Using the Exercise Capital Quake 2006, and Wellington Emergency Civil Response Plan as a reference a realistic earthquake scenario was constructed (Stuart-Black, 2018). These documents were developed for the purpose of preparing the Wellington region for an emergency response to a magnitude 7.5 earthquake where it was identified that a greater level of coordination and automatic response was needed at the national level for a major Wellington earthquake (Woodley, 2010). In these plans the northern suburb of Wellington (Porirua), the ancestral home of Ngāti Toa is classified as a vulnerable community because of the socio-economic level of the community. This scenario aims to determine the vulnerability level of Porirua while also understanding the unique perspectives of community resilience practiced by Ngāti Toa as their existing methods may not be captured by traditional resilience frameworks. To evaluate this a realistic magnitude 7.5 earthquake scenario was developed to evaluate the effects this would have on Porirua. Participants were asked questions relating to this scenario while also gauging an understanding of how community resilience would be practiced within their community, which will enable the development of an iwi led response plan. A total of twenty Ngāti Toa Iwi members participated in the Wānanga. There was a total of five Wānanga held on the 8<sup>th</sup> of October, the 21<sup>st</sup> of October, the 11<sup>th</sup> of November, the 2<sup>nd</sup> of December, and the 20<sup>th</sup> of December. Participants were recruited through online communications within the Te Rūnanga o Toa Rangatira Senior Leadership team. The research purpose and goal were shared with the leadership team who then aided in the selection of appropriate participants to represent Ngāti Toa.

## 2 TRADITIONAL MĀORI COMMUNITY RESILIENCE

An abundance of knowledge was shared by kaumatua during the korero. The key principles describing Te Ao Māori community resilience were highlighted in the inter-tribal warfare of Ngāti Toa. Ngāti Toa were at constant war with Waikato iwi over the ownership of their ancestral home Kāwhia. Following a decisive defeat by the Waikato Iwi, Waitohi, the sister of the famous Ngāti Toa chieftain Te Rauparaha, negotiated a peaceful settlement with their attackers as she had whanau relations among them through her marriage. Despite the peaceful resolution Waitohi warned Te Rauparaha that their peace would only be temporary. She shared this in the whakataukī “whakareri i to waka taua mo te pakanga ka waiho ki uta” which translates to “prepare your warship for battle and leave it ashore.” This warning urged Ngāti Toa to be vigilant and prepared. The constant subjugation to war resulted in harsh living conditions as the natural and built environment were constantly changing. Many whanau members died in war or were required to relocate due to defeat. As such, individuals needed to build their capabilities to contribute to the war and to the functioning of the community during these circumstances. This meant every iwi member was required to build their whare, waka, hunt, gather, weave, and fight. These skills were not optional, but necessary for survival. Lacking these skills resulted in a poor quality of life, and often death. To mitigate this Ngāti Toa iwi were all capable and proficient in a variety of skills, which enabled them to live in a constant state of preparedness. This meant community resilience became more than a framework, but a lifestyle born out of the necessity to survive.

The whakataukī shared by Waitohi was also tied with another proverb which states that “if you break the mast, you know how to fix the mast because you made the mast.” The pairing of these whakataukī describe two key principles that Ngāti Toa embody when practicing community resilience. These principles are 1) to ensure individuals are capable of their own survival and 2) always remaining prepared for disaster events. The principle of preparation is important to Ngāti Toa and is still a prominent feature within the iwi today. The uncertainty of war always loomed and preparation for it encompassed more than an individual’s skillset. It required the entire iwi to be prepared through constructing war waka, creating food storages, amassing

weapons, renewing defences, strengthening alliances, controlling trade routes, using technology, developing evacuation routes, and raising the capability of children. The harsh living conditions meant this was a necessity. Living in a constant state of preparedness resulted in a resilient lifestyle becoming engrained into the very fabric of their culture, a lifestyle that is still active today.

### 3 MODERN MĀORI COMMUNITY RESILIENCE

#### 3.1 Context

The following information was obtained from the wānanga and is being used to conceptualize modern perspectives of community resilience by Māori. Before proposing the earthquake disaster scenario, a variety of induction questions were asked to gauge the overall understanding of community resilience amongst Ngāti Toa Iwi members and simultaneously measure their confidence in the Iwi, Porirua City Council (PCC), and individual response plan for disasters.

Participants were asked to discuss the words or terms that best described resilience and community resilience respectively. The collective perception of what resilience is viewed as includes the term “strength” with 60% of participants listing this as the primary definition of resilience. The remainder of terms used to describe resilience varied from toughness, endurance, tenacity, mana, struggle, and hardship (see table 1 in appendix). When the term community resilience was posed to participants the collective perception changed. There was no overwhelming agreement on a specific definition, but all terms are derivatives of the principle of unity (see table 2 in appendix). The distribution terms used include iwi, whanau, collective, unity, and together. This perception of resilience and community resilience aligns with traditional indigenous perceptions of these concepts (Colbourne et al., 2019). The nature of Māori culture and their history have moulded their perceptions to view community resilience from the perspective of collective responsibility. This aligns with traditional Māori lifestyle where each whanau had specific responsibilities to contribute to the function and subsequent survival of the Pa (community). Fragments of this tradition remains alive today where specific Mātauranga of different traditional techniques are held amongst different whanau within the Iwi.

The questions that followed required participants to share their perception of safety within Porirua and their subsequent confidence in both the Iwi and PCC’s response plans. 55% of participants felt safe in Porirua if an earthquake were to strike. It is important to note that the earthquake scenario was not proposed at this stage of the wānanga, so no bias opinions were obtained when the full effects of a 7.5 magnitude were understood. Porirua is the ancestral home of all participants the comfort of home and the overwhelming presence of family fostered a shared sense of safety for participants despite the city potentially being ill prepared for an earthquake. This presents an intriguing theory proposed by Usamah et al., (2014) where a community can be vulnerable, but perceive themselves as resilient to a natural disaster. The definition of resilience used in this study is the community's ability to prepare for, respond to, and recover from a disaster, while vulnerability, refers to the community's susceptibility to harm or damage from a disaster. When examining these definitions, it becomes apparent that these concepts are not mutually exclusive. Māori communities faced with vulnerability relating to geographical exposure, economic limitations, marginalization, and historical trauma can still perceive themselves to be resilient to disasters. This perception by Māori is the result of high levels of social resilience developed through the Māori cultural values of kotahitanga (relationship development) and whanaungatanga (enhancing relationships). Building a strong sense of belonging within the community, trust among community members, active community involvement and respect for existing cultures and values enables the development of a strong baseline of social cohesion, which is considered by Chen et al., (2021) as the primary method to building a resilient community in Aotearoa.

When asked whether participants were confident in the council’s response plan for Porirua all participants had no confidence. This lack of confidence derived from a shared belief that there is a lack of communication about the response plan and simply not knowing whether there was a response plan. When asked whether they were confident in the Iwi response plan 40% of participants said they held confidence. This confidence stemmed from natural unity that blossoms from many Iwi member’s being closely related whanau (family). Those involved in the covid response for the Iwi and those who regularly attend tangi believed the innate ability of Māori to come together to support each other in times of crisis would be sufficient for any disaster the Iwi would be subjected to. The remaining 60% believed proper planning and preparation is required to withstand

the effects of disasters, but all held the same belief of their natural ability to come together and support each other through times of crisis. To increase their confidence planning, preparation, leadership, guidance, communication, and involvement with council would be required.

Participants were also asked to share the knowledge they have about their local vulnerabilities. The answers obtained indicated that Ngāti Toa have a complex understanding of the vulnerabilities in their communities without the any technical assessments. The identified vulnerabilities included poverty, the environment profile, lack of redundancy services, insufficient critical infrastructure to support growth, education of disaster risk reduction, outdated roading system, access into the city, environmental management and even a lack of resources. Identifying these vulnerabilities with no technical aid support the notion of Māori being a naturally observant people. The primary method used to accumulate this Mātauranga was done through observation and passed orally (Hikuroa, 2016). This Mātauranga increases as each subsequent generation passed. This comprehensive awareness of their environment also links to the unique relationship Māori have with the environment, especially their ancestral homes. Māori view themselves as part of their environment. The nature of whakapapa (genealogy) was more than simply tracing your ancestral origins but linking individuals to key landmarks in their communities. These landmarks amongst Māori are seen as part of their Iwi, hapu, or whanau. With this unique relationship Māori can derive comprehensive understandings of their surroundings of both the physical and social environment without the use of technical assessments. This suggest that Māori can meaningfully contribute to the planning of civil response plans and aid to identify vulnerabilities that technical assessments may overlook.

### 3.2 Response Plan

When proposing the earthquake scenario to participants all answers showed similar behavioural trends. Participants agreed their priority would be reuniting with family and congregating to the marae. No detailed response plan could be derived from these wānanga as participants indicated that this would require the coordination and participation of all iwi members who hold the relevant Mātauranga needed to effectively respond to the earthquake. Despite these requirements indicated their response may include the following:

- Reunite with whanau. Dispatch emergency vehicles to reconnect families
- Assign leadership panel to organize response plan
- Secure house and take inventory of personal resources
- Congregate whanau and resources to marae
- Secure communication line with civil defence planners
- Leaders designate and assign responsibilities within community
- Support local emergency response services
- Invite community to congregate to marae
- Secure immediate surroundings of marae and enhance the safety of community
- Establish safe travel routes within the community to surrounding churches and local businesses
- Establish school and work opportunities for the community
- Provide financial assistance to kaumatua and vulnerable communities
- Follow instruction from civil defence leaders and government
- Organize wānanga for community to congregate to plan individual recovery strategies and foster unity

This response plan focuses on the collective responsibility of the community to each other rather than the individual. Response plans that foster unity and support processes that build up the collective community is the priority response of Ngāti Toa.



### 3.3 The Need for Network Resources

The foundation required to actively participate in community resilience frameworks link to the need to have networked resources (Norris et al., 2007), this includes four principles: economic development, social capital, information & communication, and community competence. Participants were asked to rank these networked resources and redefine them into Māori principles that correspond with them. Social capital was seen as the priority principle closely followed by information & communication, economic development, and community competence. Social capital closely correlates to the nature of Māori culture. The natural unity exhibited in Māori culture is a contributing factor as to why in disaster events Māori can instantaneously respond and adapt to unfolding disasters. It has been suggested that social capital is the most important feature to develop when constructing community response plans (Chen et al., 2021). However, participants suggested that unity from a Te Ao Māori worldview is more holistic. This unity being between both the people and the environment. Holistic unity between the people and the environment is further deepened as the key landmarks of Ngāti Toa are considered whanau (family). It was also identified that poverty impacts social capital as high rates of poverty decreases the available social capital. This is because poverty is a complex issue. Prioritizing economic development may result in diverting necessary resources away from the primary goal of building resilient communities. Despite being in an impoverished state, the Ngāti Toa Iwi have a high baseline social capital. This baseline social capital is believed to be enough to override the economic struggles within their community.

#### 3.3.1 Reimagining Network Resources using Māori cultural Values

These network resources were redefined into a corresponding Māori principle. This enabled the expansion of the traditional concept of resilience. By translating the concept into Māori, the specific feature became more holistic and reflective of the specific needs of Māori.

##### 3.3.1.1 Economic Development or *Kia Takatu Tatou*

Participants were also required to redefine each networked resource into a correlating Māori principle that would more holistically describe the process, while also simultaneously resonating more with Māori. Economic development is described as equity, stable livelihoods and to be wealthy (Norris et al., 2007). This networked resource was described with four different principles by participants, these include Ohangatanga, Kia Takatu Tatou, Whakaurunga, and Whakatika te he. These principles all describe the support Māori aspirations for long-term economic development and the active participation in all matters that increase well-being. Although wealth and economic development is explicitly mentioned, the perspective these are viewed from are more holistic. Participants described these principles as extending beyond economic means to include Mātauranga (knowledge), health, well-being, and essentially methods that improve the overall quality of life. Maslow's hierarchy of needs were mentioned as a framework that describes the desired development Māori want within communities before community resilience can be developed. If people's quality of life is improved, then naturally people will become more concerned about larger issues such as disaster preparation. Poverty and poor quality of living is a major barrier stopping community resilience from being developed in vulnerable communities.

##### 3.3.1.2 Social Capital or *Whanaungatanga*

Participants redefined social capital as whanaungatanga, which translates to forming and maintaining relationships while strengthening ties between kin and communities. By this definition social capital within a Te Ao Māori worldview seeks the same outcome within an engineering sense. However, how it is developed differs. A kaumatua shared a whakataukī that describes how the social capital within Ngāti Toa is developed. The whakataukī is posed as a question, have we smelt you sweat in the kitchen? Although simple, this whakataukī links to a framework used amongst Ngāti Toa to respond to disasters, that being the whare kai model. This model is used often at a tangi (funeral) and describes how responsibilities are naturally delegated amongst whanau (family) to complete all the required tasks of the tangi to ultimately support the grieving whanau. There is no formal delegation of tasks. Whanau will simply congregate to the marae and aid those members of the Iwi who hold the associated Mātauranga of different customs. The specific responsibilities at a tangi have been handed down through the generations and taught amongst different whanau members. Each individual Mātauranga serves a purpose to support the grieving family and ensure the tangi operates in accordance with the appropriate Tikanga and Kaupapa of the Iwi. The shared sense of purpose and ability to contribute, despite an individual's potential lack in skill, is the leading cause that enables the development of

social capital within Ngāti Toa. Furthermore, there is no democratic system that elects individuals to positions of power or leadership within the iwi. There is only one way to become a leader and it requires all to first sweat in the kitchen. It is through this unlikely path that the unity of Ngāti Toa enhanced. The knowledge learnt and the relations made during these times is what builds the strong foundation of social capital within the Iwi. Each tangi acts as a small family reunion which strengthens existing relationships and helps to develop further connections. This phenomenon enables the development of a high level of social resilience despite their socioeconomic depravity. Interventions aimed at building social capital are more difficult without a basic level of financial or economic capital (Chen et al., 2021), however, Ngāti Toa have developed a model that mitigates this need.

### **3.3.1.3 Information & Communication or Na te Kakano**

A variety of Te Ao Māori principles were used to redefine information and communication. These principles include Na te Kakano, which translates to “from the seed.” This principle describes the desire of Ngāti Toa for early involvement and consultation. The Māori principle kei mou mou taima was also used to redefine this networked resource, which translates to open and meaningful communication. Transparency or ko te tumanako was the final principal participants expressed as the way to effectively communicate information to Māori. Communication requires the equal exchange of information early. Participants believed involvement of Māori is never collaborative and often too late for them to contribute to planning efforts. Failure to recognize Mātauranga Māori as a meaningfully tool to improve resilience further exacerbates this issue. Mātauranga Māori is a body of knowledge methodically created, but contextualized within a Māori world views (Hikuroa, 2018). It is integrated into the fabric of Māori culture which enables them to understand their communities’ vulnerabilities, but also their strengths in responding to disasters, what they’d need in a disaster, and how best to implement that plan. Frameworks derived for vulnerable communities must have active involvement and representatives from those affected groups to ensure their specific needs are met, as designers cannot assume what vulnerable communities need. Norris et al. (2008) further suggests that community engagement is needed to identify the differences in needs, vulnerabilities, and strengths between different groups within a community. Therefore, the principles described by participants emphasize the need for early, open, honest, meaningful, and transparent communication with Māori when distributing and communicating key information in relation to disaster risk reduction. Māori know their needs, vulnerabilities, strengths. If improving the resilience of Māori is the goal their active involvement early must be prioritized, but because of the capabilities of Māori it is the role of the engineer to coordinate planning to ensure their needs are met and skillsets utilized in response plans.

### **3.3.1.4 Community Competence or Mahia te Whare**

Community competence was redefined using the principal Mahia te whare. This principle describes community competence as an individual’s own responsibility and accountability to grow their own capability. It is believed amongst participants that growing capability is difficult if the quality of life of an individual is poor. For individuals within Porirua who suffer in poverty the future disaster event is not an earthquake but the risk of no food, water, or home. Within Ngāti Toa the ability to foster capability is possible through the Mātauranga held within the iwi. By actively participating on the marae iwi members can develop a range of skills, which includes the preparation of hangi, gathering kai moana, traditional construction methods, carving, food preparation, hunting, and even the management skills. Participants recognized that the primary purpose of these skills is to support the operations of a tangi, however, these skills have relevancy in disaster response planning.

## **3.4 Enhancing Community Resilience**

Bruneau (2003) developed a framework to quantitatively assess and enhance the seismic resilience of communities using four components. These components include robustness, rapidity, resourcefulness, and redundancy. Participants were asked to rank and redefine each of these components into corresponding Māori principles that they believed best represented the resilience feature. For this study, adaptability was also included. Participants ranked adaptability as the most important principle to developing community resilience, followed by redundancy, robustness, resourcefulness, and then rapidity. A whakataukī was used to describe why adaptability is valued above these other features described by Bruneau. The whakataukī reads “Te ararau o Tangaroa.” This translates to the many pathways of Tangaroa. The whakataukī describes the variety of methods an individual can use to travel the sea. However, the influence of the elements, weather patterns, and

processes of the sea highlight the key theme of whakataukī, which is to be adaptable because the sea is unpredictable. Earthquakes are unpredictable and building resilience using a Te Ao Māori perspective requires planning to be flexible to mitigate this. Robust buildings may collapse, redundancy systems may fail, and insufficient resources will affect the recovery timeline. Adaptability was ranked as the most important feature to building resilience amongst participants because it accounts for human error and potential oversight within the planning of response plans.

### 3.4.1 Reimagining Community Resilience using Māori cultural Values

These resilience features were redefined into a corresponding Māori principle. This enabled the expansion of the traditional concept of resilience. By translating the concept into Māori, the specific feature became more holistic and reflective of the specific needs of Māori.

#### 3.4.1.1 Robustness or Mana

Robustness was redefined as Mana, which is the power of the elemental forces of nature embodied in an object or person, which draws links to the definition of robustness, that being the ability to withstand stress without suffering degradation (Bruneau et al., 2003). In traditional Māori practices sustainability and spirituality are important principles weaved into the construction techniques of all their craft (Schmidt, 1996). Construction material imbues the very nature, spirit, and in this case mana of the origin source of the material. Locally sourced materials, the use of the most up-to-date construction standards, and a staged approach through the prioritization of developing/reviewing the robustness of critical infrastructure. Respecting the source material and following appropriate Tikanga (customs) when sourcing it is the key within a Te Ao Māori worldview to ensuring the robustness of the infrastructure is optimized.

#### 3.4.1.2 Redundancy or Mana Motuhake

Redundancy was highly valued amongst participants. Redundancy was defined as the extent to which elements are substitutable in the event of disruption or degradation (Bruneau et al., 2003). It was redefined as Mana Motuhake, which translates to self-determination, with the principle being autonomy and control. It is sometimes translated to the concept of sovereignty (Mead, 2016). In this case participants described it as the responsibility of individuals to ensure they have a backup plan in place if critical infrastructure fails. One participant redefined redundancy more appropriately to reflect this, that being Mahia te whare, which translates to fostering capabilities. Participants expressed that to grow capabilities there is often a requirement to achieve a high standard of living. However, participants suggested that the mere participation and involvement at the Marae often teaches multifaceted skills that have use in disaster planning. A kaumatua shared a story from his youth during the Great Depression. During the great depression, unemployment grew, and the import of goods and services dropped immensely, reducing the availability of food and water. Vulnerable groups dominating the lower socio-economic brackets were meant to suffer, however, kaumatua said life was no different following the Great Depression. Kaumatua indicated that their lifestyle was the primary reason many Ngāti Toa Iwi members do not recognize the economic recession. Ngāti Toa was a self-sustainable eco-system. Their food sources were naturally sourced from their harbour and rivers, while their Mātauranga in agriculture further sustained them. The skills of hunting, fishing, and farming sustainably are still passed down orally to subsequent generations in the iwi. These skills help provide the individual with an endless supply of food and water during a disaster. Not only does it empower individuals with the skills to be self-sustaining in a disaster, but it also requires no investment of money, only time.

#### 3.4.1.3 Rapidity or Kotahitanga

The most common term used to define rapidity was Kotahitanga, which directly translates to unity. Rapidity is defined as the capacity to achieve goals in a timely manner to contain and avoid disruptions (Bruneau et al., 2003). Rapidity was seen as a necessity to help the mental health issues individuals will suffer immediately following a disaster. Coming together with a singular goal and achievable milestones to restore normality is as a practical action that can be taken to bring people together. To achieve goals in a timely manner growing the unity between people and subsequently the number of available supports to dispatch in a disaster means normality can be restored sooner.

#### 3.4.1.4 Resourcefulness or Kaitiakitanga

A wide variety of principles was used to describe resourcefulness from a Te Ao Māori worldview. The idea Kaitiakitanga was mentioned only by one participant but provided a deep insight into how resilience could be

practiced amongst Māori. Kaitiakitanga describes the concept of guardianship, for the sky, the sea, and the land (Mead, 2016). How this is practiced is through the sustainable management of the natural environment and its resources. As discussed with Kaumatua from Ngāti Toa, Iwi members did not feel the effects of the great depression as harshly as others throughout the world. One reason for this is because of the access to natural resources or Kaimoana (food gathered from the sea) by the Iwi, which was the natural food source for many during those times. The location of these kai gathering places is sacred to Ngāti Toa. Kaumatua did not feel comfortable sharing the location of these kai gathering puna (spring). By living Kaitiakitanga, sustainable management of the local flora and fauna was observed, and the people of Ngāti Toa had an endless storage supply of resources that consistently sustained them through even the most difficult circumstances.

### 3.5 Marae; A Place of Refuge & Fellowship

The responses reflect the current perspectives of resilience amongst a small population of Ngāti Toa. These perspectives aim to help engineers reimagine how resilience can be developed for Māori. However, further research is required as using mana motuhake to implement redundancy is inadequate. Investigations into the impacts on Kaikōura following the 7.8 magnitude earthquake resulted in a temporary ban on recreational fishing and diving due to contamination caused by the displacement of the local seabed. Therefore, relying on natural sources for food and water as a back-up process following an earthquake would be insufficient in meeting their needs. To mitigate this Ngāti Toa emphasized the importance of retrofitting marae to support the well-being and recovery of the iwi following an earthquake. Participants suggested constructing robust and self-sufficient Marae, which will act as community hubs following a disaster. Marae is a place of refuge where traditional Te Ao Māori principles are observed, which make marae both a physical place for the community to gather and a spiritual space of safety enhanced through whakapapa relations. Marae therefore creates a sense of connectedness and unity that promotes the well-being of Māori. As safe havens they may be rapidly mobilised support centres for communities impacted by natural disasters. The strength of Marae for Māori is the shared experiences of individuals created on these grounds. These experiences will lead Māori to congregate to their ancestral homes following a disaster, which enables marae to become a place of refuge and fellowship that will support the immediate needs of iwi while providing a space to share resources. Participants suggested improving their marae using the following methods:

- Developing renewable energy to power the marae following a disaster
- Constructing additional whareniui to support the influx of people
- Increase the kitchen size to support the preparation of food for larger capacities
- Establish a secure communication line with civil defence and government that will operate following a disaster
- Strengthen existing buildings and ensure newly developed sub-structures on the marae are built to the more robust building standards
- Develop emergency food and water storages on the marae (including natural sources)
- Increase the number of toilet and shower facilities
- Increase bedding storage

Marae are default emergency shelters for Māori. Retrofitting marae with the capacity to support the community following a disaster will help support Māori to adapt their responses to suit changes in the environment (natural and built) and meet the specific needs of the people. Marae thereby becomes refuges to support immediate physiological needs of the community while also providing a place of fellowship that fosters a sense of belonging where the response is focused on the collective rather than the individual.

## 4 CONCLUSION

The history of Ngāti Toa has seen resilient practises weaved into the very fabric of their culture. This provides an opportunity to reimagine how community resilience is practised and how the equity of these frameworks



can increase. This knowledge has survived through the oral transmission of waiata, whakataukī, and pūrākau, but requires deciphering to fully understand how resilience was practised within the culture. Māori have a complex understanding of their communities' vulnerabilities. They develop unique methods to mitigate, prepare, respond, and recover from disasters, naturally incorporating the foundational principles of community resilience without directly defining them. Deriving this information from a people so aligned and immersed in nature is the knowledge required to not only improve existing disaster response frameworks but to expand the fundamental knowledge of community resilience and provide an equitable pathway for vulnerable communities to participate using the methods that best accommodate their needs. Identifying and weaving both indigenous & western practises together will enable communities globally to live in harmony with nature regardless of the changes that may occur. Community Resilience is not a switch for Māori that's activated in emergencies, but rather a lifestyle refined and expanded through generational additions of individual Mātauranga, therefore, why not derive frameworks from those who practise it so regularly and effortlessly?

## 5 APPENDIX

### 5.1 Terms Describing Resilience

*Table 1: Summary of Terms Describing Resilience*

<b>Term</b>	<b>Description</b>
Strength	A collective quality rooted in interconnectedness, interdependence, and a deep connection to the natural world and people.
Toughness	Individual quality that involves perseverance, determination, and the ability to endure hardship while maintaining a sense of connection to the community and the natural world.
Endurance	A combination of physical and spiritual strength that allows individuals and communities to persist through difficult times and maintain a sense of connection to the natural world and their cultural traditions.
Tenacity	A determined and persistent approach to problem-solving, rooted in a deep sense of connection to the community, cultural traditions, and the natural world.
Fortitude	A combination of courage, strength, and resilience, rooted in a deep sense of connection to the community, the natural world, and cultural traditions.
Struggle	A process that causes growth and transformation, requiring a deep sense of connection to the community, the natural world, and cultural traditions to persevere and overcome adversity
Hardship	An opportunity for personal and collective growth and transformation, requiring a deep sense of connection to the community, the natural world, and cultural traditions to navigate and overcome.
Resistance	The collective act of standing up against injustice and oppression, drawing on a deep sense of connection to the community, the natural world, and cultural traditions to preserve and protect their way of life.
Mana	A sense of personal and collective power, authority, and prestige that is earned through acts of service, leadership, and upholding cultural values and traditions.

## 5.2 Terms Describing Community Resilience

Table 2: Terms Describing Community Resilience

Term	Description
Iwi	The concept of extended family and community, encompassing a sense of shared identity, responsibility, and intergenerational connections that contribute to a strong and resilient community
Together	Collective action, cooperation, and interdependence, drawing on a shared sense of identity, culture, and connection to the natural world to build strength and overcome adversity.
United Strength	The collective power and resilience that emerges when diverse individuals and communities come together with mutual respect, shared values, and a commitment to working towards a common goal
Collective Strength	Ensuring that all individuals and communities have equal access to resources, opportunities, and decision-making power, thereby creating a more resilient and equitable society.
Collective Struggle	Drawing on the strength and unity of the community to face and overcome challenges and adversity, while upholding cultural traditions and values.
Kotahitanga	Unity and solidarity, emphasizing the importance of coming together as a collective to face challenges, make decisions, and work towards a common goal in a way that upholds cultural values and traditions. The process of developing and forming relationships.
Whanau/ Whakapapa	The importance of family and intergenerational connections, acknowledging the strength and resilience that comes from having a sense of belonging and connection to one's ancestors, cultural traditions, and community.

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