

Community-led disaster risk management: A Māori response to Ōtautahi (Christchurch) earthquakes

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Abstract

Since September 2010, a series of earthquakes have caused widespread social, financial and environmental devastation in Christchurch, New Zealand. Anecdotal evidence suggests that local Māori responded effectively to facilitate community recovery and resilience. Cultural technologies that are protective in times of adversity have previously been noted in Māori communities, but rarely documented. An ongoing research project conducted in partnership with the local Christchurch Iwi (tribe) Ngāi Tahu, has been identifying, and documenting the ways Māori cultural factors have facilitated disaster risk reduction and management in response to the earthquakes.

A qualitative research methodology (Te Whakamāramatanga), based on Ngāi Tahu values, and practices has shaped the community-based participatory research design. Māori research participants were recruited purposively and through self-selection. At the time of writing, the researchers had conducted semi-structured interviews with 43 Māori research participants. Culturally relevant (dialogical and narrative) interviewing approaches have been used to gather

research information and facilitate trusting relationships between researchers and local Māori communities. Community engagement has been fostered, as well as a capture of Māori understandings and practices associated with risk reduction and mitigation, disaster preparedness, response and recovery. Data analysis draws on social and risk theories as well as indigenous epistemological concepts. Initial data analysis suggests that within the New Zealand context, Civil Defence and Emergency Management policies and disaster risk reduction practices may be enhanced by the respectful integration of pertinent Māori knowledge and strategies.

Ngāi Tahu has a statutory governance role in the Christchurch rebuild as stipulated in the Canterbury Earthquake Recovery Authority Act (2011) and relational links with the New Zealand government and local authorities. Accordingly, information arising from data analysis, tribal knowledge, and Māori emergency management practices documented during this project is shaping development of contextualised risk reduction and disaster management strategies at urban and regional levels. Upon project conclusion, research results and recommendations will be disseminated to Iwi (tribes) and key stakeholders, to facilitate Māori disaster management capability, and disaster preparedness, risk reduction, and recovery planning throughout New Zealand. The researchers anticipate that lessons learned from this research may have relevance for other small island states and/or countries with indigenous populations that have similar value systems and bodies of traditional knowledge.

Keywords: Integrated, Risk, Governance, Indigenous, Management

On the 4th of September 2010 an earthquake measuring 7.1 occurred in Canterbury, New Zealand. The earthquake heralded the commencement of a cycle of major earthquakes which caused widespread urban devastation, injury to over 8000 inhabitants and ultimately the loss of 185 lives (Canterbury Earthquake Royal Commission, 2012). The Eastern side of Christchurch was the area most significantly impacted by the earthquakes and was primarily comprised of

communities with limited socioeconomic resources. The urban Māori community (25,725) which at the time constituted 7.3% of the urban population (Statistics New Zealand, 2014a) was also concentrated in the Eastern suburbs (Statistics New Zealand, 2014b). The geospatial concentration of Māori in the severely impacted areas suggested that in comparison to the wider community, Māori were disproportionately affected in terms of reduced financial resources, access to basic necessities, sanitation, power, transport and support from frontline responders. However, anecdotal stories of Māori resilience in Eastern Christchurch inferred that the local Māori had drawn on cultural values and practices to institute effective earthquake response initiatives.

The application of Māori values and practices to facilitate community recovery following disasters, although noted by Hudson and Hughes (2007) and Proctor (2010), has been relatively neglected within disaster research literature. The lack of documentation regarding the nature of Māori cultural attributes and the ways in which they may be implemented to facilitate community recovery following disasters, potentially poses a challenge to the generalised applicability of existing models of resilience (Boulton & Gifford, 2011). The Joint Centre for the Disaster Research in conjunction with the leadership of the local Christchurch Māori tribe (Te Rūnanga o Ngāi Tahu) share the perspective that knowledge, principles and practices embedded within the Māori approach to coping with the Christchurch earthquakes might be contextually relevant for disaster recovery policy development. A research partnership was established to examine the potential value of cultural attributes for informing and innovating disaster preparedness and integrated risk management strategies. Māori residing in the wider Christchurch region who had experienced the Canterbury earthquakes, as well as Māori frontline responders and other tangata whenua (Māori people belonging to a particular locality) engaged in the Earthquake response, were invited to participate in the research. The project commenced with the premise that Māori emergency management and disaster recovery practices were backgrounded by past history and

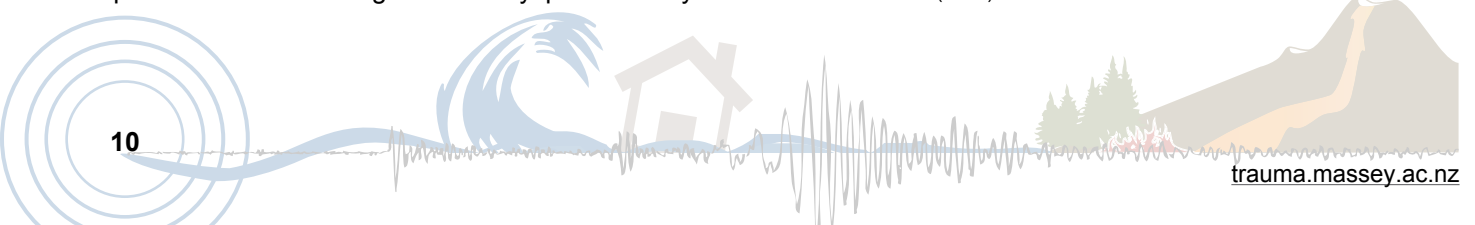
experience. This article considers how Māori resilience¹ is facilitated through traditional approaches to disaster risk reduction. It presents a framework for addressing adversity and explores how cultural values embedded in traditional approaches to disaster risk reduction were enacted in the Ngāi Tahu response to the Christchurch earthquakes. It is argued that the cohesive Māori community led response² has relevance across the continuum of hazard mitigation, preparedness, response and recovery.

The Maori Recovery Network Response to the Christchurch earthquakes was characterised by co-operation and unity. This article deliberately provides a positive story about the Māori response to the Christchurch disaster as a political act as too many articles that focus upon Māori are over-determined by a deficit thinking approach Reid, Robson & Jones(2000) provide a fuller discussion of deficit thinking. For an opinion on tensions within the Maori Recovery Network and the mainstream emergency response see Lambert (2014).

Māori approaches to Disaster Risk Reduction: A Historical Lens

As the indigenous people of New Zealand, Māori are familiar with discrete hazardous events (tsunamis, episodic flooding) as well as ongoing adversity resulting from disasters and have developed adaptive strategies to minimise disaster-related risks (King, Goff & Skipper, 2007). Māori knowledge, values and cultural practices

- 1 As indigenous researchers we believe that it is not appropriate to locate culturally embedded communitarian understandings of resilience (Boulton & Gifford, 2011; Paton, Gregg, Houghton, Lachman, Lachman et al 2007) which focus upon cultural strengths as well as collective agency as outlined in this article and elsewhere (see: Kenney, Paton, Johnston, Reid & Phibbs, 2012; and Paton, Johnston, Mamula-Seadon & Kenney, 2014) within the broader western literature on resilience. The rationale for this decision is because current resilience literature tends to provide a universalised focus upon individuals that is culturally and geographically dislocated from its origins in Europe and North America (Connell, 2007). Validating indigenous knowledges and practices through locating, and therefore subsuming them, within an authoritative western academic literature also prevents indigenous peoples from developing their own knowledges and in becoming experts on their own lives and realities (Smith, 1999).
- 2 The Māori Recovery Network Response to the Christchurch earthquakes was characterised by co-operation and unity. This article deliberately provides a positive story about the Māori response to the Christchurch disaster as a political act, as too many articles that focus upon Māori are over-determined by a deficit thinking approach. For example, Reid, Robson & Jones (2000) provide a fuller discussion of deficit thinking in relation to Māori. For an opinion on tensions within and between Māori and the mainstream emergency response see Lambert (2014).



are inter-related and co-constitutive actants³ (Latour, 2005) that shape tangata whenua behaviours and actions at the iwi (tribal) hapū (community) whānau (family) and individual levels to ensure community well-being. Collectively informed by experience, these cultural attributes, create unfinalised assemblages (Latour, 2005) which operate as highly adaptable technologies to facilitate coping with daily challenges, including disasters.

Within the disaster context these cultural technologies⁴ constitute an emergency response framework (see Figure 1) that may be adapted and applied to manage disaster-related risks, mitigate the social and environmental impacts of disasters as well as facilitate community recovery and sustainability. The first of the three core components of the Māori adaptive framework for addressing adversity is *Mātauranga Māori* (Māori knowledge). Māori knowledge and understanding of natural hazards, is crafted from physical knowledge ascertained from the senses, perceptual knowledge created through the interpretation of experience and theoretical knowledge developed in response to the evaluation of subtle environmental patterns. These forms of knowledge collectively comprise all information pertaining to aspects of the environment, for example geophysical, marine and ecological knowledge that may be used to shape Māori community responses to disasters.

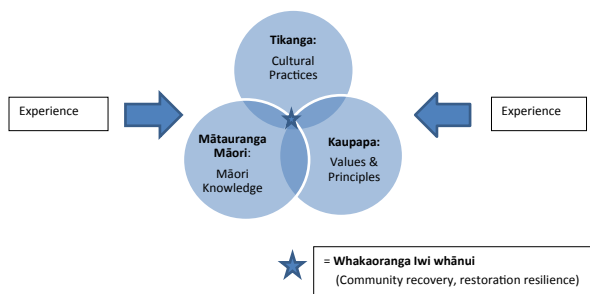


Fig 1: Conceptualisation of Traditional Māori Approach to Disaster Risk Reduction (Kenney and Phibbs, 2015)

3 *Actant* is a term applied by Bruno Latour (2005) to denote artefacts, concepts or practices that influence human behaviour.

4 In this context we suggest that Māori cultural technologies bring together both Foucauldian and Latourian conceptualisations of technologies. Physical as well as metaphysical cultural technologies, such as whakapapa, manaakitanga, land, or marae, may be conceptualized as heterogeneous relational and material entities that achieve durability through linkages created by the actions of actors (Latour, 1999; Callon, 1987). These cultural technologies also function as technologies of the self, production, domination and signification (Foucault, 1972, 1976). Kenney (2009) provides a fuller discussion of linkages between indigenous knowledges and Foucauldian and Latourian technologies.

Kaupapa (Māori values and/or principles) effectively constitute a set or moral rules that are relationally implemented to address natural hazard risk and mitigate the impact of natural disasters. Foundational values include *whakapapa* (genealogy) and *whānau* (family). Within the Māori world, families are the core units of cultural capital so genealogies shape social infrastructure on Māori marae (community centres). Emergency management roles are delegated to specific families and in some instances individuals in times of adversity. The intergenerational transmission of these roles has ensured that emergency response training commences at an early age and incorporates observational learning of future responsibilities. Other key values also shape Māori approaches to natural hazards management. *Kaitiakitanga* (guardianship, protection) underpins a social obligation to provide a safe environment for the wider community. *Manaakitanga*, which encompasses extending hospitality, respect and support to all community members during a disaster, is enacted through the provision of basic necessities (shelter, food) and psychosocial support. *Whakawhanaungatanga*, meaning the process of building and maintaining relationships, includes the operationalisation of intra and extra-tribal relationships to mobilise resources and activate social support networks.

Tikanga (cultural practices) are the physical manifestation of Māori knowledge and values. Traditional environmental risk mitigation practices such as land mapping and settlement fortifications protected communities by preventing land slippage from episodic flooding as well as ensuring that settlements were developed on stable bedrock. Coastal *marae* (community centres) were situated so inhabitants could identify early indicators for tsunami and/or king tides and respond accordingly. Inland settlements were located in proximity to rivers to facilitate food security, with secondary sites established as flood evacuation centres. Food security was enhanced by the application of resource management practices. The implementation of traditional conservation practices ensured sustainable hunting and fishing. Eel and fish traps for example, were designed to capture limited numbers of mature stock. *Mahinga kai* (traditional gardens) were seasonally planted and harvested. Food security was also facilitated through food preservation (smoking/drying) and storage practices. *Pataka* (raised stores) protected food resources from foraging birds and floods. *Rua kumara* (ground storage pits) ensured root vegetables did not get affected by frosts. When natural

disasters occurred it was understood that skills and material resources, such as food and accommodation, would be made available to ensure the needs of the entire community were addressed.

Within the contemporary setting of Christchurch, the Māori community have reported acting in accordance with cultural values and implementing cultural practices in order to support community well-being and encourage community recovery following the earthquakes. As one tribal manager stated:

Immediately it [the September earthquake] struck home that hey, we've got a responsibility to a whole community of people, that we need to ensure they know that we're here for them, and available to assist. (JR)

Research into how these traditional values and practices are utilised to support community resilience in times of adversity has relevance for contemporary emergency preparedness and response initiatives.

Research Design

The Joint Centre for Disaster Research is leading a large research programme that is identifying factors which build resilience in rural and urban communities of New Zealand. A component of this programme has focused on capturing Māori experiences and perspectives of the Christchurch Earthquakes and was conducted by Māori members of the research team in partnership with the local Iwi (tribe) Te Rūnanga o Ngāi Tahu. Traditional cultural attributes that facilitated Māori community recovery have been identified and the ways in which they were applied to sustain community resilience in response to the earthquakes are being documented.

The Māori community-based participatory research project drawing on the Christchurch context has addressed existing gaps in the disaster research literature relating to how cultural technologies promote and sustain indigenous resilience following earthquakes. Community-based (and directed) Participatory Research (CBPR) is a research approach that facilitates relationships of trust with community research partners, and is an effective method for promoting the wellbeing of Indigenous communities (Israel, Schulz, Parker, & Becker, 1998) - in this instance the Ngāi Tahu and wider Māori communities of Christchurch. The community-based qualitative research has been designed and implemented in accordance with Kaupapa Māori research principles. This approach

ensures that research is designed by and for Māori, addresses Māori concerns, is implemented by Māori researchers and conducted in accordance with Māori values (Smith, 1999). The Māori research methodology Te Whakamāramatanga (Kenney, 2009) shaped the establishment of a research partnership between the Joint Centre for Disaster Research and the tribal administrative body as well as the implementation of a culturally appropriate and contextually relevant approach to conducting the research. Māori values and principles constituted methodological concepts, which included genealogy, building relationships, protection/ensuring safety, creating trust, respectful negotiation, equity, advocacy, self-determination, empowerment, and agreement.

Ethical approval to conduct the project was received from the Massey University Human Ethics Committee and Te Rūnanga o Ngāi Tahu Research Services. Ngāi Tahu elders also provided ethical oversight, offering cultural advice for the duration of the research project. Te Rūnanga o Ngāi Tahu and other local Māori stakeholders subsequently facilitated participant recruitment. As the cultural practices of *kanohi ki kanohi* (face to face communication) and the oral tradition of passing down Māori knowledge, values and practices through stories are highly valued aspects of Māori culture. Both practices were employed during the data collection phase of this project. Information gathering was also enhanced by the adoption of a conversational or dialogical (see Frank, 2005) approach to interviewing that disrupts the social power differentials between researchers and research participants (Freire, 1967, 2000; Sonn & Green, 2006). Interview topics were collaboratively determined, covering: Iwi (tribal) and organisational responses; the concerns and unmet needs of Māori communities; the ways in which cultural beliefs, values and practices build organisational and community resilience; how distinctive cultural and geographical knowledge may inform urban and civil defence planning; as well as recommendations for disaster preparedness planning within Māori organisations and communities.

The research partnership collaboratively agreed on the process for dissemination of research results. Public reporting has been a gradual process with representatives of Te Rūnanga o Ngāi Tahu and the Joint Centre for Disaster Research regularly negotiating the level of information accumulated as well as the process, mediums and venues for information disclosure. Knowledge dissemination to the Māori community has

been ongoing as the research project has progressed. As part of that process, and with participants' approval, a percentage of interview tapes will be securely stored in the Te Rūnanga o Ngāi Tahu archive for posterity. Te Rūnanga o Ngāi Tahu will also determine the degree to which the distinct cultural information generated by the research may be made publically available. Ngāi Tahu has, for example, reviewed and endorsed the contents of the current article prior to publication in the journal. General results, including recommendations around setting priorities for embedding civil/ system resilience, are being disseminated through diverse methods such as Māori *hui* (meetings), conference presentations, and peer-reviewed publications. The researchers anticipate that Te Rūnanga o Ngāi Tahu and the Joint Centre for Disaster Research will collectively draw on research findings to advocate for improvements to urban, civil defence, emergency services and disaster preparedness planning throughout New Zealand in the longer term.

Research Results: The Māori Community-led Response to the Ōtautahi (Christchurch) Earthquakes

The Māori community-led response to the earthquakes in Canterbury was the impetus for the creation of a Māori Recovery Network. This network linked with the mainstream emergency management infrastructure to ensure the inclusion of, and accessibility to resources and support for the diverse communities in Christchurch. The Māori Recovery Network constituted a culturally and contextually relevant disaster management system that was based on Māori values and operationalized to support community resilience.

Māori Emergency Management: Establishing Governance

Although Te Rūnanga o Ngāi Tahu tribal members comprise a minority group within the Canterbury Māori community (Statistics NZ, 2014b), the tribe bears the responsibility of guardianship for the region and has a cultural obligation to protect and ensure the wellbeing of the Canterbury environment and the wider population. Immediately following the February 22, earthquake in 2011, this Iwi (tribe) undertook a leadership role in developing the co-ordinated Māori response to the earthquakes. The Chairman of Te Rūnanga o Ngāi Tahu Board, Sir Mark Solomon, invited Māori tribal leaders, as

well as Māori representatives from central government and private organisations, to an earthquake response strategy development meeting held at Rēhua marae on February 23, 2011. The meeting was also attended by representatives from Te Rūnanga o Ngā Maata Waka, (Christchurch Urban Māori Authority), Te Puni Kōkiri (Ministry of Māori Development), the Te Tai Tonga (Southern Māori) electorate, the New Zealand Police, and the Ōtautahi Māori Wardens Association (Marae Investigates TVNZ, 2011). The Māori Recovery Network was collaboratively established within 24 hours of the February 22, 2011 earthquake, and according to tribal leader Sir Mark Solomon:

It took us around 15 minutes to get a unanimous agreement that all the Māori groupings would work together. In fact, I put it right down to one man – (names CEO) of Ngā Maata Waka Urban Māori authority. He simply looked at me and he said 'Mark no me no you, just us,' I said 'Yes!'

Attendees agreed that the Māori response to the earthquake sequence would be led by Te Rūnanga o Ngāi Tahu, and that Sir Mark Solomon would act as the media spokesperson. Ngāi Tahu negotiated communications and collaborative decision making with Government ministries, local authorities, NGOs and various Northern iwi (tribes), to facilitate a coordinated response to managing urgent disaster-related concerns (Te Puni Kōkiri, 2011a). Effective leadership was perceived by community responders as a key component in ensuring a well organised emergency management response. Research participants characterised the Māori response leaders as follows:

Ngāi Tahu..., it's got leaders and they're not only real life-savvie they're just smart strategic thinkers as well... (Marae volunteer)

What was neat too was... Mark Solomon the Kaiwhakahaere (Chairperson) leading by example... they (the managers) weren't asking ...all their staff ...to do anything they wouldn't do themselves... (Rūnanga Employee)

In addition to effective leadership, regular communication between key stakeholders ensured that logistical arrangements, including the consolidation of social and material resources, were carefully coordinated. National inter-tribal networks were operationalised to facilitate the storage and transport of goods to Christchurch, for distribution to the community. Resourcing support was

rapid and comprehensive as the following interview extract demonstrates:

Container loads arrived here at Wigram from Pipitea marae in Wellington, it was loaded with canned food, blankets, napkins, baby formula, baby bottles, ah everything you could think of - three container loads, and just three days after the earthquake. (JR)

Attendees also agreed that the Māori response would be driven by Māori values. A community responder described the creation of the initial mission statement: "On the first day the leaders adopted a theme - 'aroha nui ki te tangata' love to all people - so it didn't matter who we come up against, we helped them" (MW). Community enactment of the Māori value *aroha nui ki te tangata* signalled that local Māori intended to provide support to the entire community not just the local Māori community, and this message was reinforced in media releases from the Māori Recovery network as follows:

We are collectivised we have brought the Māori providers together to table a stock take of what they can offer so that we can link in with other services to help out in the community... I asked the community if we could include the Asian and migrant communities to which I got immediate agreement... This disaster has hit everyone and our response is for the people of Christchurch... You ride it out you survive you get on with rebuilding and the way to do it is that you do it together as a community.

Sir Mark Solomon, in Marae Investigates interview (2011)

In addition to media and telecommunications, the Māori Recovery Network leadership used other mediums, including personal contact and social networks to inform the Māori community about the agreed upon cultural approach to managing the earthquake disaster. According to Paton, Johnston, Mamula-Seadon & Kenney, (2014), message dissemination was effective and the Māori community responded accordingly.

Māori, Communities, Emergency Management and Disaster Risk Reduction

The Māori Community-led response to the Christchurch earthquakes exemplifies the ways in which traditional Māori knowledge values and practices are inter-related and actioned as cultural technologies to facilitate disaster risk reduction and community resilience. Research participants have identified various cultural values including *kotahitanga* (unity); *whānau* (family); *whakapapa* (genealogy); *whakawhanaungatanga*

(building /maintaining relationships); *marae* (community centres); *manaakitanga* (respect/support/hospitality), and *kaitiakitanga* (guardianship) as key actants in shaping responders' actions. The resulting behaviours of disaster responders were in turn culturally framed by research participants as inter-generational practices that facilitated the *whakaoranga* (restoration and resilience) of the community. Extracts from participants' talk showcase the ways in which values and practices interacted, as detailed below.

The Ngāi Tahu city marae Rēhua was designated an Earthquake Recovery Assistance Centre on the 23rd of February 2011, followed a week later by the national urban marae Ngā Hau E Wha, which became an outreach hub for displaced government agencies, the banking sector and various community organisations (Te Puni Kōkiri, 2011b). Within the Māori world, marae are considered *kaupapa* (a place where traditional principles are observed), enacted values that constitute both a physical place for the community to gather and a spiritual space of safety that is framed by the value *whakapapa* (genealogy). Marae therefore support a sense of connectedness that reinforces Māori identity and well-being. As safe havens they may be rapidly mobilised support centres for communities impacted by natural disasters. Following post-quake building inspections, Ngāi Tahu opened their 12 marae in Canterbury as shelters for displaced residents and extended hospitality and support to the entire community.

...we had to turn to one of the cultural mechanisms of support we know, so obviously we turned to our marae (community centres) because they are right there when a storm hits, there for everyone, pakeha (non- Māori New Zealanders) and Māori. (TO)

Enactment of the value *whanaungatanga* (relationships) through drawing on inter-tribal connections, ensured that a week after the February 22, 2011 earthquake all tribal marae in the South Island and several in the North Island were hosting evacuees (Te Puni Kōkiri, 2011c). Expressions of *whanaungatanga* (relationships) took various forms, inter-tribal, inter-agency and tribal/government communication linkages enhanced the coordination of resources and reduced the duplication of services to the community. As one recovery assistant remarked:

The communication between our staff and other services was good. We kept in touch with Te Puni Kōkiri (Government agency responsible for Māori

affairs), they are friends as well as relatives so... we knew if the whānau (families) weren't getting the assistance that was needed they would contact us... (SO)

Whanaungatanga (relationships) also manifested in the deployment of human resources. Several iwi (tribes) fielded teams of registered health professionals to address the health needs of residents in Eastern Christchurch. Community access to health and well-being services in the eastern suburbs was limited as a result of liquefaction, fractured roading and the traumatisation of healthcare personnel (Sullivan and Wong, 2011). Sir Mark Solomon conceptualised this act as an expression of whanaungatanga in that:

...as part of their koha (gift of support), Te Arawa sent down a group of nurses, Tainui sent down doctors and nurses, and Raukawa also sent down doctors and nurses.

The 13 Māori doctors, 18 Māori nurses and counsellors mobilised from Rēhua marae as barefoot medical teams⁵ providing primary health care services to the most inaccessible suburbs including Aranui, Dallington and Bexley.

An earthquake information and advice service was established by Te Rūnanga o Ngāi Tahu. This service relisted the tribal organisation telephone number as an emergency contact centre for accessing assistance the day after the February 22nd earthquake (Sharples, 2011). During the immediate period after the earthquake and in keeping with the kaupapa (principle) aroha nui ki te tangata (extend love and support to all), Māori telephonists provided 24 hour coverage to ensure information and support were constantly available to the wider community. The telephonists worked extended shifts willingly and often, as one research participant stated:

We had a mobile phone that was going 24/7...We would be getting calls at 2 in the morning, 3, 4am just people wanting to talk, because the shakes were constantly going... it was just knowing that someone else was up with them and we were happy to do that...we rotated the phone around the five of us... worked all day, then we would be on the phones all night. (PO)

5 In this context barefoot medicine refers to a group of health professionals who deliver outreach services through providing door to door health care, needs evaluation and support in communities that are isolated, disadvantaged and/or impacted by disasters. An overview of the history of barefoot doctors is provided by The World Health Organisation (Weiyuan, 2008).

Other local responders engaged with the community directly. After the February earthquake, many families struggled to obtain basic necessities such as food, water and shelter. Local Māori wardens enacted the kaupapa (principle) of manaakitanga (hospitality) extending respectful support to address households' immediate needs. Sir Mark Solomon commented that:

Our (Christchurch based) wardens they got out into the community - they door knocked on close to 10,000 homes, they delivered around 1600 food packages, they delivered water, anything that people asked for, we delivered.

Although the New Zealand Police had requested that the national Māori wardens' would be operationalised to provide security services in the Eastern Suburbs, the 160 wardens who were deployed to Christchurch initiated delivery of basic necessities from Rēhua marae to on average 4,800 people per week until late April, 2011 (Te Puni Kōkiri, 2011c). The Māori Recovery Network also initiated a door knocking campaign, and used the traditional practice of kanohi ki te kanohi (face to face engagement) to conduct direct assessments of community members' levels of well-being, resources and accommodation circumstances. As one Ngāi Tahu manager remarked:

It was about getting out to the people, engaging face to face and offering support. (DA)

Logistical administration, including the reception, storage and distribution of gifted resources, was managed from the Ngāi Tahu base of operations at Wigram. Volunteers from the local Māori community unpacked goods from various containers and shipping crates then repacked the resources for delivery. Material resources offered as koha (gifts of respect) through the inter-tribal support network, were carefully chosen and comprehensive, as one Wigram-based volunteer notes:

We had care parcels arrive in from Tauranga Iwi (tribes)...There was a lot of baby stuff which was great because a lot of the mothers had lost stuff and there was real thought given to a lot of these parcels. (MA)

Resources were also often accompanied by written expressions of support for the community as the following interview extract demonstrates:

We'd get containers in from the Kohanga (kindergarten) in Wellington and they would leave

little notes with the kai (food) and clothing for people and it was primo! (SH)

This provision of support to Christchurch families by Māori pre-school children based in Wellington may be regarded as an example of the way in which intergenerational learning about emergency preparedness and value driven responses is facilitated within Māori communities.

Allocation of resources was determined daily in response to updated information regarding community concerns. For example, debriefing meetings were regularly held at Rēhua marae to ensure that community needs and issues as well as alterations to logistical arrangements were communicated to responders. The wider Māori community was also regularly updated about response initiatives via marae connections, emergency support networks including texting trees, tribal websites and facebook links. Te Rūnanga o Ngāi Tahu staff have estimated that the Māori recovery network delivered food, water and other necessities to approximately 18,000+ households in Christchurch (Solomon, 2012). The Māori collective approach to disaster management, which may be characterised as both community-led and community-centred, constitutes an enactment of the Māori value kotahitanga (unity) and is described by one research participant as follows:

In the end everyone came to our house..., there was 18 to 20 people living in our house with us for 8 weeks. And that is what you do as Ngāi Tahu, as Māori you come together..., you take in whoever needs somewhere to stay..., you offer support. (PO)

Unity is a characteristic of Māori whānau (families), which in acting as the key unit of social capital within Māori communities, equally constitutes a core value supporting Māori health and wellbeing. During disasters, whakapapa links (family networks) are drawn on for support and family members who have access to resources will offer them willingly, for example:

I've still got my son and a granddaughter and her partner and a baby living in my house... One came in from the first earthquake in September, the other one after November, and they haven't left... you have to look after whānau..., we put tents in our back yard... (Ngāi Tahu Employee)

In most participants' stories the principles of kotahitanga (unity), whānau (family) and whakapapa (genealogy) were interrelated and facilitated a level of social

connectedness that enhanced community recovery. A tribal employee explained the value of Māori familial social cohesion within the disaster context as follows:

When they (the Government) want to encourage people to respond well to disaster..., they encourage them to make connections to their neighbours their family... Well that already naturally occurs with an Iwi (tribe); and that is their first advantage... an advantage that you can't underestimate... That whānau (family) and that connectedness-base, underpins why Ngāi Tahu performed so well during the earthquake. (LA)

The social obligations imposed by Māori kinship structures to support relatives in times of adversity are not confined to extended family. Viewed through a Māori cosmogonical lens, kinship ties are extended to include the tribal homeland. The whenua (land) is understood to be the original progenitor of human life, and recognised as Papatuanuku, the earth mother (Marsden, 1992). Relational connection to the land is underpinned by a responsibility to protect the both the physical and social elements of the Canterbury environment through enacting kaitiakitanga (guardianship). Ngāi Tahu has operationalised this value by engaging as partners with Environment Canterbury in developing new environmental initiatives (Environment Canterbury, 2012). The Mahanui Iwi Management Plan addresses Iwi (tribal) resource protection in the Christchurch region while a broader partnership between Ngāi Tahu and Environment Canterbury called Tuia brings together cultural conservation practices and statutory responsibilities to help ensure the sustainability of natural resources. Another measure for enacting guardianship of the social environment is Ngāi Tahu participation in urban rebuild planning (CERA, 2012). As one community responder stated:

We have a responsibility as kaitiaki (guardians) of our land to work with CERA (the Canterbury Earthquake Recovery Authority) and the others to plan for the future. One of the ways we can help is by using our cultural knowledge to inform the redesigning and rebuilding of Christchurch. (TN)

Additional measures have included fostering Māori workforce development by providing tribal support for He Toki ki te Rika (the Māori Trade Training Scheme) (Te Rūnanga o Ngāi Tahu 2012a) and developing social housing initiatives to ensure that the wider community will have access to affordable accommodation (Te

Rūnanga o Ngāi Tahu 2012b). Te Rūnanga o Ngāi Tahu owns substantial tracts of land within Christchurch and the surrounding areas that were already under development prior to the Earthquake sequence. Despite soaring market prices, the tribe has fixed land purchase prices at pre-September 2010 rateable values, because: "Profiteering from the misery caused by the earthquake does not fit well with our tribal values" (CEO Te Rūnanga o Ngāi Tahu Holdings).

Research participant's comments underpin the notion that Māori share a collective '*ensemble identity*' (Kenney, 2009) that is genealogically linked across social communities, tribes and land. Relational connectivity imposes obligations on Iwi *whānui* (tribal members) regardless of social position, to ensure the well-being of the environment, land and people following natural disasters. The Christchurch earthquake sequence has acted as a catalyst for the revitalisation of traditional values and practices in the Māori community which, reframed as moral and relational technologies (see Kenney, 2009), have facilitated disaster management and community recovery following the Canterbury earthquakes. Collectively, these technologies constitute a dynamic cultural framework for ensuring urban recovery, social resilience, and regional sustainability.

Māori Cultural Technologies: A Valuable Addition to Integrated Disaster Risk Reduction

Within the context of Aotearoa, New Zealand

Research into community-led disaster management is relevant across the continuum of hazard mitigation, preparedness, response and recovery, and to wider themes of sustainable development (Paton, 2007). Moreover, community-based programmes are an effective tool for building disaster resilience in communities (Johnston, Becker & Paton, 2008; UNISDR, 2005). To date Māori resources and cultural strengths have not been integrated into pre-disaster planning and emergency response strategies at the national level in any meaningful way. The prompt and effective Māori response to the Christchurch quakes has acted as the genesis for increased engagement and collaboration between Iwi (tribes), local authorities and government. In addition, Te Rūnanga o Ngāi Tahu has used their legislated authority as guardians of the land and natural resources within Canterbury to secure a statutory governance role in the Christchurch rebuild,

as stipulated in the Canterbury Earthquake Recovery Authority Act, (2011). This public private partnership has helped ensure that findings from this research are being communicated directly to the Crown via established links between Te Rūnanga o Ngāi Tahu, the New Zealand cabinet and relevant government agencies. The relationship between Ngāi Tahu and the Crown has ensured that key information arising from the research informs national disaster preparedness policies. Ngāi Tahu historical and epistemological knowledge is also shaping integrated risk management strategies developed in collaboration with other local stakeholders (Crown, Canterbury Earthquake Recovery Authority/ CERA, Christchurch City Council) who are engaged in civil/disaster preparedness planning and in rebuilding Christchurch (CERA et al, 2012). As an exemplar, Ngāi Tahu geological strata information, including intergenerational knowledge about land composition and stability as well as the location of underground water courses has been ascertained and used to develop a digitised geo-physical index. In the longer term, this information will inform urban and rural planning, facilitate environmental sustainability and contribute to community resilience throughout Canterbury and the South Island of New Zealand.

The Global Context: Considerations for the Hyogo Framework for Action

The Community-led Māori response to the Canterbury earthquake sequence, through showcasing the value of Māori cultural attributes to disaster risk reduction strategies, has facilitated key activities designed to address priorities stipulated in the Hyogo Framework for Action 2005-2015 (UNISDR, 2005). Institutional recognition of local risk patterns, and the need to decentralise disaster risk reduction resources to relevant local authorities has been illustrated. The Canterbury emergency management infrastructure has been enhanced through promoting Māori community participation in disaster risk mitigation planning and civil disaster management within the region. The use of knowledge and resources to build a culture of safety and resilience is a key concern (Paton & Johnston, 2006). Within the Christchurch context, relevant information has been managed in ways that have strengthened linkages between public and private sector stakeholders and enabled local authorities to act to build resilience. In this instance, the capture and tailoring of Māori cultural heritage, in the form of contextualised values, environmental protection knowledge, traditional

resources and disaster mitigation practices has important implications for emergency management and response. Collectively, these attributes have supported capacity building through the development of holistic integrated disaster risk monitoring and management across the region.

Disaster management networks including intra- and extra-tribal relationships have been strengthened and cross-sectorial dialogues have been encouraged. The Hyogo Framework for Action asserts that promoting a coordinated regional response enhances policy, technical and institutional capacities in disaster management at local regional and national levels while advocating for the active participation of relevant stakeholders. The statutory role undertaken by Te Rūnanga o Ngāi Tahu in regards to the urban rebuild provides a case in point and ensures the engagement of Māori, in strategizing for regional sustainability. Within Aotearoa, New Zealand, there is growing government acknowledgement of the contextual relevance of Māori approaches to disaster risk reduction that are founded on traditional values, forms of knowledge and practices. In keeping with the Hyogo Framework for Action recommendation that cultural diversity should be taken into account when planning for disaster risk reduction (UNISDR, 2005), the current research partnership is optimistic that appropriate mechanisms will eventuate for the wider integration of cultural risk reduction technologies into mainstream disaster management strategies. The researchers also anticipate that such technologies and the Aotearoa, New Zealand exemplar may have relevance for other small island states and nations with indigenous populations that have a history of value framed practices for addressing disaster risk and recovery. Applying the Hyogo Framework for Action to findings from the Christchurch research is timely given that this international framework is currently being reviewed and is due for renewal in 2015.

Conclusion

The Māori community-led recovery network linked with mainstream emergency managers, government agencies and other responders to ensure that resources and support were readily available to the culturally diverse communities of Christchurch. Māori response initiatives have demonstrated how cultural knowledge, values and practices may be utilised to respond to disasters and support community resilience. Foundational values including genealogy, family,

guardianship, hospitality and respect interweave with cultural practices such as the operationalising of marae in order to provide broad-based support for communities in times of adversity. Human and organisational disaster risk reduction capacity is strengthened through intra- as well as inter-tribal linkages. Collectively, Māori actors and cultural actants, in this instance values, bodies of knowledge as well as practices, create assemblages that function as dynamic technologies of disaster risk reduction and resilience. The researchers anticipate that lessons learned from this research may have relevance for other small island states and/or countries with indigenous populations that have similar value systems and bodies of traditional knowledge.

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