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A Māori love story: Community-led disaster management in response to the Ōtautahi (Christchurch) earthquakes as a framework for action

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ABSTRACT

Within the disaster response and research sectors, there is increasing recognition of the value of community-led initiatives that facilitate emergency management, risk reduction and community resilience. In contrast, the value of cultural approaches to disaster management and recovery is rarely acknowledged. The Māori disaster management response to the Christchurch earthquakes and subsequent urban recovery process constitutes an exemplar of best practice. During the emergency management phase, Māori risk management initiatives were collaborative, effective and shaped by kaupapa (cultural values), specifically the value, 'aroha nui ki te tangata' (extend love to all people). In this article, the potential value of Māori kaupapa-based technologies for shaping contextually relevant disaster management and risk reduction strategies is considered. The discussion draws from research findings arising from two projects conducted by the Joint Centre of Disaster Research in partnership with Te Runanga o Ngāi Tahu (resident Māori tribe) that address Māori disaster-related concerns, including factors that facilitate community recovery. An overview of the Māori emergency response, including perceived hindrances, is provided as background. Drawing upon frameworks provided within Actor-Network Theory cultural technologies that facilitate community well-being and recovery are identified and the ways in which technologies were operationalised within the emergency context, outlined. With reference to the Hyogo Framework for Action the applicability of integrating Māori technologies into national civil defence emergency management policies is also discussed and recommendations are proposed for adapting and implementing these technologies as a component of integrated disaster risk reduction at the local, national and international levels.

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1. Introduction

The current impacts and predicted global consequences of climate change have contributed to a growing awareness that community led disaster management and recovery initiatives are relevant to integrated disaster risk reduction research and governance [1]. Case studies from the Asia/Pacific region have suggested that traditional indigenous knowledges constitute valuable components of effective community-led responses to natural hazards [2]. The United Nations has recommended in the Hyogo Framework for Action (HFA) that cultural diversity should be a policy consideration that is supported through engaging relevant communities in disaster risk reduction planning [3]. In spite of the UN stance on integrated disaster management and emergent research

[4] that has further highlighted the relevance of indigenous engagement in contextualised disaster risk reduction, there is minimal inclusion of cultural knowledge or practices in formal disaster response and emergency management structures. The New Zealand context presents a case in point. The indigenous Māori people of New Zealand have applied traditional knowledges, values and practices to address disaster-related risks and community recovery during previous periods of adversity [5]. Cultural attributes that are protective of community well-being have also been noted in contemporary Māori communities following discrete flooding events [6–7]. However, the nature of these attributes and the ways in which they have been operationalised to manage disaster-related emergencies and mitigate the impact of disasters on communities, remain largely neglected in the research literature. Anecdotal reports of the Māori response to the Christchurch earthquakes support the notion that Māori community-designed approaches to post-earthquake disaster management and recovery demonstrated best practice in relation to the Hyogo Framework for Action. The knowledge, values and cultural practices embedded

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within effective Māori disaster response frameworks may innovate and enhance formal disaster management strategies and response mechanisms. Accordingly, the Joint Centre for Disaster Research is conducting research in partnership with Te Runanga o Ngāi Tahu to identify Māori disaster management technologies and the ways in which they have facilitated disaster risk mitigation and community recovery following the Christchurch earthquake sequence.

2. Research design: material and methods

Community-Based Participatory Research (CBPR) facilitates relationships of trust with community research partners, and promotes the wellbeing of indigenous communities [8]. In this instance, two inter-related Māori resilience research projects have been centred within, and shaped by the Christchurch Māori community in accordance with statutory principles developed from the articles of the Treaty of Waitangi [9,10]. The Māori community-based participatory research projects, through drawing on the Christchurch context, have collectively addressed existing gaps in the disaster research literature relating to how cultural technologies can facilitate disaster management and risk reduction as well as community recovery following earthquakes.

2.1. Methodology

Kaupapa based Māori research [11] is designed by and for Māori, addresses Māori concerns, is conducted predominantly by Māori researchers and is based upon Māori cultural values. To that end, the qualitative Māori research methodology Te Whakamāramatanga [12] has shaped the community based project design and implementation. The foundational concepts of the methodology include: whakapapa (genealogy, continuity); whakawhanau (building relationships); whakarururanga (safety), whakaetanga (acceptance, agreement, consent); whakaritenga (negotiation); whakangungu (protection, advocacy); whaka-whirinaki (building trust); whakamana (empowerment); ōritetanga (equity), and mana motuhake (autonomy, self-determination). Although the methodology was developed in the health arena, the current research projects have extended the applicability of 'Te Whakamāramatanga' to the fields of natural hazards, and disaster research [13]. The methodology has been operationalised within a research partnership framework that has been designed to foster cross-cultural engagement. In keeping with this research approach, ethical approval to conduct the research has been received from the Massey University Human Ethics Committee as well as Te Runanga o Ngāi Tahu research services. Cultural oversight of the projects has also been provided by a Ngāi Tahu advisory group comprised of Māori elders.

2.2. Data collection

Māori tribal and community stakeholders facilitated the recruitment of research participants. Data collection focused on ascertaining the stories and views of Māori disaster response personnel including community volunteers and responders employed by Te Runanga o Ngāi Tahu, Māori organisations as well as Government agencies such as the New Zealand Police. As passing down Māori knowledge, principles and practices through stories is a highly valued aspect of Māori culture, the earthquake accounts of 43 participants were collected through semi-structured individual and group interviews. The culturally acceptable value and practice of *kanohi ki kanohi* (face to face communication) was employed during interviews, and information gathering was enhanced through the application of dialogical (conversational) interviewing methods [14]. Dialogical interviewing is considered an effective

tool for ensuring that power differentials between researchers and research participants are disrupted [15,16]. As Māori participants may also have been traumatised by their earthquake-related experiences, this method of data collection would also be considered a psychosocially appropriate approach for ascertaining information [17]. Interview topics were determined as the research evolved and issues were identified as important by participants. Overarching themes for discussion included specific tribal and Māori organisational recovery initiatives; ways in which Ngāi Tahu (cultural beliefs, values and practices) facilitated disaster risk reduction and mitigation; distinctive cultural knowledge that could inform civil defence and emergency management policies, as well as recommendations for disaster preparedness planning within Māori organisations and communities.

2.3. Data analysis

Interviews were digitally recorded and transcribed verbatim. Following transcription, research participants reviewed and finalised their interview transcripts, as well as gave consent for the transcripts to be analysed. The researchers drew on theoretical ideas from Western European and Māori paradigms to craft a conceptual bricolage which was used to analyse research participants' stories. Participants' interview talk, was analyzed in paragraph format to ensure that data interpretation was accurate. Investigator and theoretical triangulation processes were applied to minimise misinterpretation of participants' stories. In this regard, the Māori researchers' familiarity with cultural values and practices ensured that analytical interpretation of participants' talk, as well as the cultural attributes embedded in their stories, was contextually accurate. As the research progressed, the researchers also liaised with Māori participants to ensure that emergent findings accurately reflected the participants' experiences. Some participants requested further meetings to add interview commentary as well as discuss initial findings arising from the analysis. During these interviews, any discrepancies in understandings were addressed in order to accurately reflect participants' experiences and facilitate clarification of research results.

2.4. Theoretical framing of research findings

Data analysis drew on abductive research strategies [18] to facilitate the researchers' understanding of the interview material. Analytical descriptions and explanations of cultural factors that facilitate disaster risk reduction and management were characterised in terms of the meanings and interpretations assigned by participants to personal values and practices, other people's actions, as well as social situations. Actor Network Theory [19] framed data analysis through shaping interpretations of Māori knowledge, values and cultural practices pertaining to disaster risk reduction as inter-related and co-constitutive actants¹ that influenced Māori behaviours at the collective and individual levels. Given the diversity of cultural attributes that underpin the Māori community's capacity to respond to the earthquake, research findings were also considered in relation to socio-environmental approaches to managing disasters that focus on facilitating resilience, including the Adaptive Capacity Model developed by Douglas Paton and others [20].

Actor-Network Theory explores the ways in which technologies and the social mutually shape interaction. Callon [21] and Latour [19,22], for example, theorise objects as heterogeneous relational and material technologies that achieve durability through the

¹ Actant is a term applied by Bruno Latour (2005) to denote artefacts, concepts or practices that influence human behaviour.

linkages created by the actions of actors. Technological actants are hybrid actors, constituted by 'hard' material and by the social universe in which they operate and which they help create [22]. Technologies are therefore embedded in actor-networks which are able to transform and redefine the heterogeneous elements that constitute the network. Within Actor-Network Theory a natural hazard, such as an earthquake, may be regarded as a non-sentient 'actant' that without intention simultaneously influences human behavior and transforms social networks. Drawing upon and extending Actor-Network Theory Kenney [12] explores the way in which indigenous values and beliefs operate as metaphysical actants that guide action. Physical as well as metaphysical cultural technologies, such as whakapapa (genealogy), manaakitanga (hospitality), land, or marae (community centres), may be conceptualised as heterogeneous relational and material entities that achieve durability through linkages created by the actions of actors. In this paper we consider how material and non-material cultural technologies embed resilience and shape Māori responses to the Canterbury earthquakes.

Resilience is fostered through proactively instituting mechanisms that enable individuals, communities, organisations and institutions to manage their hazard risks as well as to adapt, learn and grow from the challenges presented by natural hazard events [1]. The Adaptive Capacity Model outlines key psychological and social factors that influence community hazard preparedness, and provides a framework for exploring indicators of individual as well as collective resilience and the inter-relating pathways between them [23]. At the individual level adaptive capacity involves self-efficacy, a sense of community as well as a commitment to place. Key features of community capacity include collective efficacy (or preparedness) as well as levels of social connectedness, reciprocity, empowerment and trust. Adaptive capacity is enhanced by pre-existing forms of community leadership in which the identification of problems as well as the development and implementation of solutions occurs in collaboration with others. Organisational capacity refers to the degree to which disruption is minimised through the implementation of plans to ensure the safety and continuity of core functions, as well as the maintenance and enhancement of capacity over time. Adaptive capacity also encompasses the social, cultural, economic and environmental contexts in which a natural hazard event occurs. Societal capacity is therefore influenced by the forms of social and economic capital available as well as the way in which institutional capabilities, relationships and resources are mobilised to support emergency preparedness planning, response and recovery [1,4]. In communitarian cultures collective action is integral to sustaining societal functioning in the aftermath of a natural hazard event. Collectivised adaptive capacity refers to the degree to which a community is able to help those affected by securing resources from outside of the community as well as by accessing and utilizing support from government institutions [24]. Having been trialled in Australian, Asian and American settings; the relevance of the Adaptive Capacity Model to the New Zealand context is currently being evaluated. This paper provides an example of how collectivised adaptive capacity may be used to provide support to individuals and the wider community.

2.5. Knowledge dissemination

The Joint Centre for Disaster Research and Te Runanga o Ngāi Tahu have jointly agreed on the process for dissemination of the research results. Public reporting of research findings has been a gradual process, with the levels of information released, as well as the mediums for information disclosure being subject to re-negotiation. As part of that process, and with research participants' approval, a percentage of interview tapes will be securely stored in

the Te Runanga o Ngāi Tahu archive for posterity. The wider Māori community has also received regular information updates from the researchers as a result of relationships with key stakeholders in the Māori community as well as indirect reports from Ngāi Tahu organisational intermediaries. Concerns related to the potential appropriation of distinct cultural knowledge were addressed through ensuring that Te Runanga o Ngāi Tahu and other Māori knowledge holders determined the degree to which such information generated by the research would be publically available. Recommendations arising from the research, that pertain to setting priorities for embedding system resilience through inter-relating Māori disaster risk reduction strategies, have been made available by the Joint Centre for Disaster Research and GNS Science. Te Runanga o Ngāi Tahu and the Joint Centre for Disaster Research are also drawing on research findings to build Māori community and organisational disaster management capacity as well as to advocate for improvements to emergency service and disaster preparedness planning throughout New Zealand in the longer term.

3. Research results – Māori emergency management in Christchurch

3.1. The Christchurch context

Although the Christchurch earthquake sequence had a catastrophic impact on the people and wider environment of Canterbury, the Eastern region of Christchurch was most severely affected [25]. Māori resided in all suburbs but the majority of the community lived in the low socioeconomic sectors of the city including the Eastern suburbs of Aranui, Bexley and Dallington [26]. Given the economic disparity between the Eastern suburbs and other areas of the city, it might be inferred that the Eastern communities would demonstrate reduced adaptive capacity in response to the earthquakes. Anecdotal reports suggested that the reverse situation occurred. Media commentary noted that the Māori community organised rapidly and that a community-led response network was established to address the urgent needs and longer term recovery concerns of the wider community. The response to the community was led by the local tribe (Ngāi Tahu) and framed with a mission statement in which the Māori value 'aroha nui ki te tangata' (extend love to all people) united and directed action [27].

3.2. Māori emergency management: collective identity, responsibility, leadership, agency and action

In the aftermath of the February 22, 2011 Christchurch earthquake community groups spontaneously organised to provide support to Christchurch residents. The Student Volunteer Army [28], Rangiora Express [29] and Farmy Army [30] are examples of local groups that provided a substantial contribution to the disaster response. Services provided by these groups included recruiting and placing volunteers, digging liquefaction, providing transport as well as logistical support for the mainstream response, distributing food, hot meals, emergency supplies and essential items [28–30]. The Ngāi Tahu-led Māori Earthquake Recovery Network while also providing similar services differed from these groups as they had pre-existing linkages into the community, a built infrastructure that was able to be used to provide shelter to people who were displaced by the earthquakes, established external linkages to government agencies, such as the ministry for Māori development, as well as traditional authority over the region in which the earthquakes occurred. This section provides an overview of how the Māori Recovery Network

responded to the Christchurch earthquakes.

Te Rūnanga o Ngāi Tahu comprise a minority group within both the Christchurch and Canterbury Māori communities [31], but as the resident tribe in Christchurch, had a cultural obligation when the earthquake sequence commenced to ensure the wellbeing of all residents in the region. After the February 22, earthquake in 2011, the Iwi (tribe) initiated the development of a co-ordinated Māori response to the earthquakes. The Chairman of Te Rūnanga o Ngāi Tahu Board Sir Mark Solomon requested a meeting with Māori representatives from government, private organisations and other tribes in order to develop a collaborative earthquake response strategy [32]. The meeting was held at Rehua marae on February 23, 2011 and attended by representatives from Te Rūnanga o Ngā Maata Waka, (Christchurch Urban Māori Authority), Te Puni Kōkiri (Ministry of Māori Development), Te Tai Tonga (Southern Māori) electorate, the New Zealand Police, and the Māori Wardens [27]. A national Māori Recovery Network was formally established and attendees unanimously agreed that Te Rūnanga o Ngāi Tahu as kaitiaki (guardians) of the region would undertake the leadership role and provide governance for the coordination of community support. Tribal leader Sir Mark Solomon was delegated the role of media spokesperson. He subsequently communicated and negotiated decision-making with NGOs, Northern iwi (tribes), as well as Government and Local authorities in order to ensure that the Māori Recovery Network coordinated effectively with the formal disaster management infrastructure [33]. Research participants identified effective formal leadership as a key factor in ensuring the coordination of emergency management and disaster risk mitigation initiatives. The qualities and actions of the tribal leader were characterised by a rūnanga employee as follows:

“What was neat too was... Mark Solomon the Kaiwhakahaere [board chairman] leading by example... they [the managers] weren't asking ...all their staff ...to do anything they wouldn't do themselves... (MW)”

Individual leadership skills are recognised within a Māori worldview. However, the notion of rangatiratanga (collective leadership), which is conceptualised as both a value and a practice, is equally privileged, and research participants expressed high regard for the various levels of collaborative leadership evidenced during the Māori response to the earthquakes, for example:

“Each morning new packs of supplies would arrive, we'd pack them into house packs, and those... packs would then... be delivered in vans and by Māori wardens ... every day, without fail! So Rehua [Māori community centre] functioned pretty well, you've got to take your hat off to (names emergency managerial collective), because they did a very good job. (DH)”

And:

“We are collectivised we have brought all the Māori providers together asked them to table a stocktake of what they can offer ... so that we can link in with all the other services to help out in the community... I asked the Māori community if we could include the Asian and migrant community, because they would be outside, to which I got an immediate agreement... (Sir Mark Solomon, 2011)[27].”

Sir Mark Solomon's comments draw attention to the notion that individualised identities, responses and decisions may be counterproductive to the well-being of Māori and other communities adapting to life in the aftermath of the earthquakes. His request for permission to widen the level of support provided by the Māori recovery network to all Christchurch communities acknowledges the collective authority of the Māori community and

signals willingness on the part of the Māori disaster management leadership to comply with the community's directives. One reading of his remarks might be that in the Māori community's response to the disaster, decision-making regarding the implementation of support is a product of collective agency. In this context collective agency has facilitated a collaborative response that has ensured broad-based support for the entire community and provided targeted assistance to communities identified as particularly vulnerable, such as the migrant and Eastern suburb communities. In doing so it may be inferred that the Māori community's approach to disaster risk reduction is not merely inclusive of the 'other' but accepts collective responsibility for the 'others' well-being. As previously indicated, undertaking collective responsibility for the well-being of others who reside in or visit one's tribal region constitutes enacting the cultural principle kaitiakitanga, which encompasses the provision of protection and guardianship. After the earthquake kaitiakitanga was variously expressed through the practices of whanaungatanga (respecting and supporting relationships) and manaakitanga, (expressing hospitality), both at local marae (tribal community centres) and through individual actions as evidenced in the following interview talk:

“At the marae (Rehua recovery assistance centre), the whanaungatanga, and manaakitanga... That's what I really loved about just being there together... there'd be some waiata (songs) going and a big kai (meal). People could just come and you know whether they went and made cups of tea for the other people, or you helped in other ways, but there was no pressure, people just wanted to help (GS).”

In regard to providing support another volunteer also commented:

“I went to the Addington raceway (evacuee support centre) to help the evacuees. I sat with them, I listened to them, I held their hands, I made them cups of tea. I got food for them, I played with the children so they could have a bit of time out, I hugged them, and this I did until Addington raceway was closed. From there I went to Cowles Stadium (recovery support hub). When Cowles stadium was closed I was so sad because a lot of people still needed to be with other people, because that sense of connection is what gave them a sense of security. (JTW)”

From a Māori view point, accepting responsibility for others is also intrinsically linked with enacting rangatiratanga (actioning leadership) and is embedded at every level of interaction during times of adversity as the following comment from a Ngāi Tahu elder demonstrates:

“In Christchurch they said, 'we can't come home', [to the marae] we gotta look after the people in the street because they don't know how to look after themselves, and they don't know how to cook! They don't know how to hunt for food'... So they said, 'We is taking responsibility in the streets.' Our people were doing that all throughout Christchurch and they were able to have hangis (cooking with earth ovens)-they were having hangis our people in the city (RT)”

The links between collectivised identity, responsibility, agency and action are further illustrated in a marae volunteer's comments in which she identifies herself in the first instance as belonging to the Iwi:

“I was just so proud of being Ngāi Tahu with the number of people whose houses we went round to and they looked at me and went thank you Ngāi Tahu thank you (MW)”

In the above extract, the individual's collective de-gendered

identity, as Ngāi Tahu, is also acknowledged by the recipients of support in the volunteer's description of their expressions of gratitude ('thank you Ngāi Tahu thank you') for emergency assistance.

Traditional governance structures within Māori communities, in which problem solving naturally occurs in collaboration with others, is an example of how adaptive capacity is enhanced through pre-existing and inclusive forms of leadership which are able to be rapidly operationalized in an emergency. Collective leadership whilst not explicitly mentioned has an absent presence in participants' talk. The various expressions of leadership, framed by Māori values, were evidenced at every level of the Māori response as well as in linkages between the Māori disaster response governance group and the national emergency management infrastructure. In sum the Māori Recovery Network may be understood as a contextually relevant disaster management system that acted nationally and operationalised cultural attributes to address disaster-related emergencies, risks and recovery concerns. The following section draws upon Actor-Network Theory to provide an analysis of how Māori value-based technologies contributed to mitigating disaster-related risks and facilitating community recovery.

3.3. Māori cultural technologies and disaster risk reduction

Actor-Network Theory explores the way in which the social is shaped by linkages that are created through relationships between technologies and actors [19]. Value based technologies that direct action within Māori communities include manaakitanga (hospitality), whakapapa (genealogy), family connectedness, relationality (whanaungatanga), reciprocity and face to face communication. This section considers how actor-networks that were embedded in, and created through, these value based cultural technologies linked with material artifacts, such as marae (community centres), land, hangi (earth ovens), water, cell phones and trucks to support the mainstream response to the earthquakes.

The kaupapa (core principle) for the Māori Recovery Network 'aroha nui ki te tangata', was contemporaneously actioned as a mission statement, and value-based technology aimed at unifying and directing action. Once operationalised, the technology encouraged Māori community members to enact traditional values in material ways in order to mitigate disaster risks and support the recovery of the wider community. In doing so 'aroha nui ki te tangata' constituted both a metaphysical and material technology of resilience. One Māori elder who participated in the research described the attributes underpinning aroha nui ki te tangata in the following way:

"We've just got to keep ... talking about it, keep encouraging our young ones and it's all not about money... it's about aroha ki te tangata... Aroha ki te tangata, it's what you can give of yourself. Not all of the time, some of the time, a little bit of the time. But when you can and you're able to give it, then give it. (RN)"

The participant's remarks infer that viewed from a Māori perspective 'aroha nui ki te tangata' constitutes both a value and a set of practices that must be learnt because the giving of time and self for the good of all, rather than the well-being of the individual, is considered a positive indicator of a person's mana (prestige, quality). Giving of yourself is also a key cultural practice associated with manaakitanga (hospitality). As previously stated, various expressions of manaakitanga were evidenced in participants' interview talk, including the following account of young Ngāi Tahu who spontaneously formed a working group to dig liquefaction at elders' properties in the river suburbs of Christchurch. The group organiser commented:

"We knew [names several elders] ...so make sure they're ok first, and help them out and ... That wasn't organised from TRoNT (Te Rānanga o Ngāi Tahu) that was just a few of the boys getting together... we just knew that those Kaumatua [elders] would be in a bit of trouble to be honest, and it was the right thing to do! (TN)"

As learning about and practicing Māori values begins at an early age young people were involved in all aspects of the Māori community response [34]. The actions of the young Ngāi Tahu, documented in the previous interview extract, clearly illustrate the degree to which manaakitanga is embedded in sets of understanding about what it means to be and act 'correctly' as Māori. In that the group's cohesive response is also shaped by tribal connections, the enactment of manaakitanga may be understood as co-constructed and inter-related with expressions of the cultural values kotahitanga (unity), whakapapa (genealogy, family connectedness) and whanaungatanga (relationality). Actor-Network Theory enables an exploration of the way in which Māori cultural values operate as metaphysical and relational technologies that achieve durability through linkages that are created by the actions of indigenous actors. These intertwined value-based technologies are contextually relevant for all Māori and collectively shaped the disaster response behaviours of Ngāi Tahu who lived outside Canterbury as well as the levels of support offered by other iwi (tribes), as illustrated in the following interview extracts:

"Our whanau [families] in Blenheim [a town located four hours north of Christchurch], they were bringing down fresh water, trucks of water as well and they were going around... plus they got [access to] beautiful water at Tai Tapu [near Christchurch] and they were filling up the water there and then going around [the community]. (MW)"

And:

"We had Iwi [Northern tribes] coming down looking to assist. To help out and we were providing them with what information we could on where their people were and those of their people that had contacted us about what their people's core needs were. (DO)"

In the aftermath of the earthquake local and regional actor-networks were reconfigured to support communities impacted by the disaster. The logistical support provided by the Māori Recovery Network locally, regionally and nationally, as highlighted in the above participants' remarks, was diverse, comprised of both material and human resources, and enhanced by effective communication between key stakeholders. As an exemplar Te Rānanga o Ngāi Tahu established a local emergency information contact line which was staffed by tribal members 24 h a day [33], while texting trees operated nationally and internationally to disseminate updated information to responders:

"We didn't know anything and there was no way of getting that message around...to our door knockers, which areas are really badly damaged? Is it all of Christchurch? So we were living in the void... first thing to do was have a point of contact with whanau external of Christchurch... Text them directly and they become your point of contact to all the other whanau... So a whanau texting tree to keep us informed. (LN)"

Tribal volunteers also received, stored and distributed goods to the wider community often in circumstances where, due to fractured roading and liquefaction, households had become physically and socially isolated for extended periods [35]. Participants commented that isolated residents perceived interactions with responders as a form of social support, for example:

"We were going round and door knocking. I remember knocking on this door, I had a Ngāi Tahu jacket, my driver's license so they

could see who I was and “kia ora [Hello], I’ve got some frozen fish and a bag of fresh vegetables would you like them?” They looked at me and I remember this old woman burst into tears and she said “Where are you from?” I said “Te Rananga o Ngāi Tahu” and she goes “It’s the Maoris, the bloody Maoris that remember us”. We haven’t seen anyone since this [the earthquake] happened! (MW)”

Supportive social interaction is encompassed by the Maori cultural practice of *kanohi ki te kanohi* (face to face engagement). This inter-personal value was enacted by Māori responders who door knocked in the hardest hit suburbs in order to assess householders’ needs and concerns [36]. Face to face communication was also preferred by Māori health professionals who collectively operated as barefoot medical teams moving between households to provide emergency health care to isolated residents [37]. In addition the practice of *kanohi ki te kanohi* was implemented on local *marae* (Maori community centres) in order to provide support for homeless residents and evacuees.

Historically, Māori *marae* constitute cultural attributes that have provided safe havens for local residents and visitors following natural hazard events [6]. After the Christchurch earthquakes these physical places provided psycho-socially protective spaces for distressed residents through enacting the cultural value *whakarurutanga* which encompasses the creation and maintenance of a safe environment for those in need. At that time, accommodation requests were numerous as approximately 110,000 Canterbury homes were uninhabitable, and/or without power, water or sanitation services [38]. The Māori Recovery Network responded by opening all *marae* in the South Island, as well as several in the North Island, to act as temporary shelters for displaced residents [36]. In this instance, a national actor-network of heterogeneous assemblages created through linkages between the cultural value of *whakarurutanga*, individuals, service providers, *whānau* (families), *iwi* (tribes) and *marae*, respectively configured as meta-physical and material actants, provided safe spaces for displaced residents. Community requirements in terms of other basic necessities (i.e. food, water, clothing) were also considerable. In response, the Māori Recovery Network provided significant material and social resources to the wider community of Christchurch, exemplified as follows:

“Our [Ngāi Tahu] 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. (MS)”

This participant’s comment constructs the Māori communities’ collective approach to addressing the issues created by the earthquake disaster as well-coordinated and highly effective. In support of this hypothesis, in the following interview extract Sir Mark Solomon, through referencing a conversation with the Minister for Earthquake Recovery Gerry Brownlee, infers that the value of Maori cultural attributes have been recognised by key government stakeholders:

“Mark this earthquake’s been the biggest learning curve I’ve had in my life”. “What do you mean by that Gerry?” He says “well what most people don’t know is that every night I’ve gone down to the Eastern suburbs and just stood around one of the water tankers. What I’ve heard out there about what Maori have done, has damned well shamed me, it’s been that big. The Hon Gerry Brownlee Minister for Earthquake Recovery said that. (Sir Mark Solomon)”

The Minister’s views are echoed in comments by the former member of parliament for Christchurch East, now Mayor of Christchurch, Lianne Dalziel:

“The Maori response... should be seen as a template for the future, with a door-to-door approach that identified need from a holistic perspective of health and wellbeing—physical, mental and spiritual. (Lianne Dalziel)” [39]

Mayor Lianne Dalziel’s comments offer an extremely positive overview of the Māori response. However, there were also tensions in regards to the ways in which the formal emergency management initiatives were conducted as well as communication between the Māori Recovery Network and the national emergency management governance and infrastructure.

3.4. Challenges to Maori engagement in community recovery

The Māori Recovery Network was established to ensure that the mainstream response to the earthquakes was accessible to different communities within Christchurch. Conversations with Māori involved in the emergency response following the Manawatu floods [6] and the Christchurch earthquakes identified as key issues delayed co-ordination between Māori agencies and emergency services as well as reported difficulties in securing representation within agencies charged with emergency preparedness and response planning. A lack of Māori representation within national and local emergency management agencies meant that Māori community needs, capacity and capability were over looked in emergency preparedness planning ensuring that issues identified following the Manawatu floods in 2004 were still present at the time that the Canterbury earthquakes occurred.

A review of the involvement of a single *marae* in the 2004 Manawatu flood event [6] identified tensions in the relationships between emergency management and local Māori associated with the *marae*. Despite being registered as a civil defence hub there was no formal relationship with local civil defence authorities and attempts to establish direct engagement during this period were unsuccessful. The review recommended Māori representation on local bodies involved in developing emergency policy and planning in order to improve stakeholder communication, address Māori community needs and integrate *marae* into the civil defence infrastructure. The much larger Māori response to the Christchurch earthquakes involved multiple *marae* as well as stakeholders. Similar issues to the concerns identified in the Hudson and Hughes (2007) [6] report were also present in the narratives of Christchurch participants. The foresight of Ngāi Tahu Kaumatua (elders) had ensured that prior to the 4th of September 2010 earthquake some of the *marae* located within the general Christchurch area were registered as civil defence locations:

“...we’re in with Civil Defence, and same with a lot of the *maraes* here, *Rehua*, that’s civil defence, ...same with *Ngā Hau e Wha...* that was well before that (the September earthquake), last century I made them all civil defence posts... Because that’s what we are... (RT)”

Following the February 22, 2011 earthquake coordinating an integrated response with emergency management was delayed as communication with Civil Defence took eight days to be established through external mediators [40], whilst Christchurch *marae*, that had been registered as civil defence hubs were not formally operationalised [41]. The delayed coordination of the Māori response with the formal disaster and emergency management infrastructure contributed to duplication or the absence of services in some regions [40]. Volunteering by Māori responders was also constructed as unnecessary on several occasions. The deployment of Māori ‘barefoot’ medical teams to the Eastern suburbs, for example was challenged by local authorities [37].

Ngāi Tahu kaumatua (elders) that we talked to described Civil Defence as a ‘hard to reach’ organisation, for example, one elder

who had previously held a senior role liaising with government in regards to Māori welfare issues said:

“way back in ... 1993 there was [Cyclone] Bola, the Tairawhiti [and] Edgecumbe earthquakes and I said to Civil Defence in Wellington... ‘the places for the disaster areas, the sector posts ought to be every marae in this country!’ ... ‘You people, you want to put people into the school or church, where ... [are] the mattresses, ... the cooking facilities, ... the toilet facilities? So it’s time you people recognise that the marae is the only place in this country for sector posts... I’ve been saying that for years ... [But] No because they want to keep it to themselves... (AC)”

Regional, civil defence emergency management services located in Canterbury were regarded as culturally insensitive due to the absence of a Ngāi Tahu presence within the organisation:

“...About Civil Defence... And I’ve sort of gone over it in my mind and talked with others about it-you know ...we’re not visible in Civil Defence... as Ngāi Tahu. We might be visible in there as a Maori person, but we’re not visible in there as Ngāi Tahu. (WR)”

Participants’ narratives indicate a desire for a closer relationship with Civil Defence than had existed at the time of the September 2010 and February 2011 earthquakes. Delayed co-ordination of activities between groups, as well as reported difficulties in accessing services and distributing supplies, illustrate the importance of positive linkages between responding agencies and communities prior to a disaster event. A lack of Māori representation in disaster preparedness and response planning created barriers to the inclusion of Māori perspectives, capacity and capability in emergency response initiatives. Māori communities are more likely to experience poverty and disadvantage, deprivation is identified as a key underlying risk factor for exposure to hazard events and for the erosion of resilience in the post disaster period. The Canterbury earthquake series has underscored the importance of developing resilience within the Māori community as way to mitigate natural hazard risk.

4. Discussion: Māori technologies of resilience and integrative risk management

The value of the Māori economy is estimated at 38 billion dollars [42] suggesting that Iwi have considerable organisational and human resources which are able to be drawn upon to support community resilience in response to natural hazard events. Therefore in Aotearoa/New Zealand, integrative disaster risk management should be inclusive of ethnic differences and needs to integrate cultural strengths into policy and planning at the local, national and international levels. To that end, the Hyogo Declaration (2005) is used as one of the key frameworks for disaster risk reduction. Building on the 1994 Yokohama Strategy the Hyogo Declaration is a layered model for disaster risk reduction that ranges from macro level initiatives such as creating legislative frameworks to mitigate natural hazard risk to micro level actions aimed at encouraging individual preparedness. [3]. The Framework identifies that in all action areas cultural differences should be taken into account when planning for disaster risk reduction. Implementation of the five action strategies within the Hyogo Framework in New Zealand also needs to be cognisant of national legislation regarding the Treaty of Waitangi.

Signed between Māori and representatives of the British Crown, the Treaty of Waitangi (1840) is regarded as one of the founding documents of New Zealand society [9,10,43]. Currently, all government agencies, organisations and individuals who receive funding from the Crown are required to act in accordance

with the principles of the Treaty of Waitangi. Aspects of the Treaty principles related to partnership, participation and protection may be identified in government legislation governing the Christchurch rebuild in which Ngāi Tahu are included as a formal statutory partner. Protection of wahi tapu (sacred) sites, for example, through having culturally significant locations included in the CERA blue print for the city is seen as restoring mana (status) to the Iwi (tribe). Sharing of power through the inclusion of Ngāi Tahu as an equal partner in Canterbury Earthquake Recovery Authority Act, (2011) [44] alongside the City Council and the Region Council adheres to the principle of partnership, whilst participation is secured through the on-going involvement of Ngāi Tahu in the rebuild of the city.

The fourth area for action within the Hyogo Framework [3] focuses upon reducing underlying risk factors in three key areas: environmental and natural resource management, social and economic development, and land use planning. Priorities for action in relation to the environment are centred on the sustainable management of ecosystems through integrated resource management programmes that are cognisant of disaster risk reduction as well as the impacts of climate change. The Canterbury earthquakes highlighted Ngāi Tahu responsibilities as guardians of the whenua (land) and iwi whānui (wider Ngāi Tahu community). Relational connection to the land is underpinned by a responsibility to protect both the physical and social elements of the Canterbury environment through enacting kaitiakitanga (guardianship) [45]. Ngāi Tahu has operationalised this value by engaging as partners with Environment Canterbury in developing new environmental initiatives [46]. A partnership between Environment Canterbury and Ngāi Tahu brings together traditional conservation practices and statutory responsibilities to facilitate the sustainable management of natural resources while Iwi resource protection for the Christchurch region is included in the Mahanui Iwi Management Plan. Another measure for enacting guardianship of the social environment is Ngāi Tahu participation in urban rebuild planning [47]. As one Ngāi Tahu 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)”

Incorporating disaster risk assessment into urban planning as well as the design and placement of infrastructure will reduce exposure to future disasters [3]. Ngāi Tahu historical and epistemological knowledge is shaping integrated risk management strategies developed in collaboration with national and region stakeholders who are engaged in civil/disaster preparedness planning and in rebuilding Christchurch [48]. As an exemplar, Ngāi Tahu intergenerational knowledge about land composition and stability as well as the location of underground water courses is being prepared so that this information is able to inform urban and rural planning, facilitate environmental sustainability and contribute to community resilience throughout Canterbury and the South Island of New Zealand.

Effective integration of the action strategies within the Hyogo Framework for disaster risk reduction requires understanding and addressing underlying risk factors through social and economic development as well as policies that are aimed at alleviating poverty [3,49]. The resilience of tribal members is being addressed through proactive Iwi initiatives targeting factors that are associated with earthquake vulnerability such as unemployment, financial hardship, and poor housing. Te Runanga o Ngāi Tahu has developed a matched savings scheme to address declining home

ownership rates as well as to improve financial literacy among Iwi members with savings able to be used to secure a deposit on a house [50]. Māori tend to have higher unemployment rates, to be concentrated in unskilled work and to earn lower average hourly wages than their European counterparts [51]. In 2009, for example, the unemployment rate among Māori youth aged 15–24 years was 27.5% compared to 14% for European youth. The Māori trades training scheme He Toki ki te Rika, which was set up in 2011 in partnership with Christchurch Polytechnic Institute of Technology (CPIT) and Hawkins Construction, is fostering Māori workforce development through getting young Māori into trades training and employment in recovery related work [52]. In a post-earthquake climate where nationally 23.2% of Māori youth are not in training, education or employment [53] graduating from class and securing a job is creating a collective culture of success among young Māori involved in the scheme. The Ministry of Tertiary Education has subsequently endorsed the initiative through contributing additional funds to the scheme. Developing public private partnerships to foster a culture of disaster prevention is incorporated into the fourth action area of the Hyogo Framework [3]. He Toki ki te Rika is an example of a private public partnership that uses workforce development to mitigate disaster risk through addressing persistent poverty and unemployment in Māori communities.

Paton and Johnston [1] suggest that emergency management planning needs to focus upon utilising resources to facilitate adaptive capacity within individuals, communities, organisations and societal institutions. The Māori response to the Christchurch earthquakes suggests that Māori already possess the kinds of cultural capital that is associated with increased adaptive capacity. Attributes associated with enhanced adaptive capacity that are present within Māori communities include place attachment, social connectedness fostered through a strong sense of community, a commitment to reciprocity, the existence of robust external networks, participation in decision-making, sound leadership, collective capacity, efficacy, empowerment and trust as well as local knowledge and expertise. Embedded resilience is illustrated through the ability of communities to adapt to the challenges presented by a natural hazard event and to take advantage of new possibilities that are opened up in the aftermath of a disaster [1]. Partnerships with government agencies charged with the Christchurch rebuild, engagement with Environment Canterbury

and the creation of the Māori trades training scheme He Toki ki te Rika are examples of transformation and growth within Māori communities following the Christchurch earthquakes. In this regard, the researchers suggest that the Adaptive Capacity Model may successfully showcase Māori knowledge, values and hazard mitigation practices, through interrelating traditional cultural attributes, conceptualised as moral and relational technologies of resilience, with global understandings of disaster risk reduction and resilience.

Actor-Network Theory draws attention to how the social is transformed in response to a natural hazard event as new linkages are created between people, NGOs, state sector actors and actants such as, food, cell phones, vehicles, water, buildings, liquefaction and land. Māori cultural values also operated to drive actions that supported the disaster response. With regard to the value-based foundation of the Māori response, *aroha nui ki te tangata*, *whakapapa*, *whanaungatanga*, *manaakitanga* and *kotahitanga* comprise the core actants of an unfinalised assemblage of cultural attributes, actors and material resources that can act effectively as a nationalised disaster management and risk reduction system. Collectively informed by experience, these cultural attributes are co-constitutive and function as adaptable moral and relational technologies that enhance Māori capability in coping with natural hazards such as the Christchurch earthquakes (See Fig. 1).

Within the disaster management context, cultural technologies are adapted and applied to mitigate disaster-related risks, address the social and environmental impacts of disasters as well as facilitate community recovery and resilience. Research findings suggest that the Māori disaster risk reduction system continually adapted to the destabilised environment of Christchurch, by incorporating additional cultural attributes and/or value-based technologies, such as *marae*, *kanohi ki te kanohi* and *whakarururanga*, as the context required. The researchers anticipate that lessons learned from the Christchurch experience in regards to Māori capacity and capabilities may enhance civil defence policies and formal emergency management structures. Links back to the theoretical frameworks used, and recommendations developed as a result of lessons learned from the Christchurch earthquakes, are taken up in the final section of this paper.

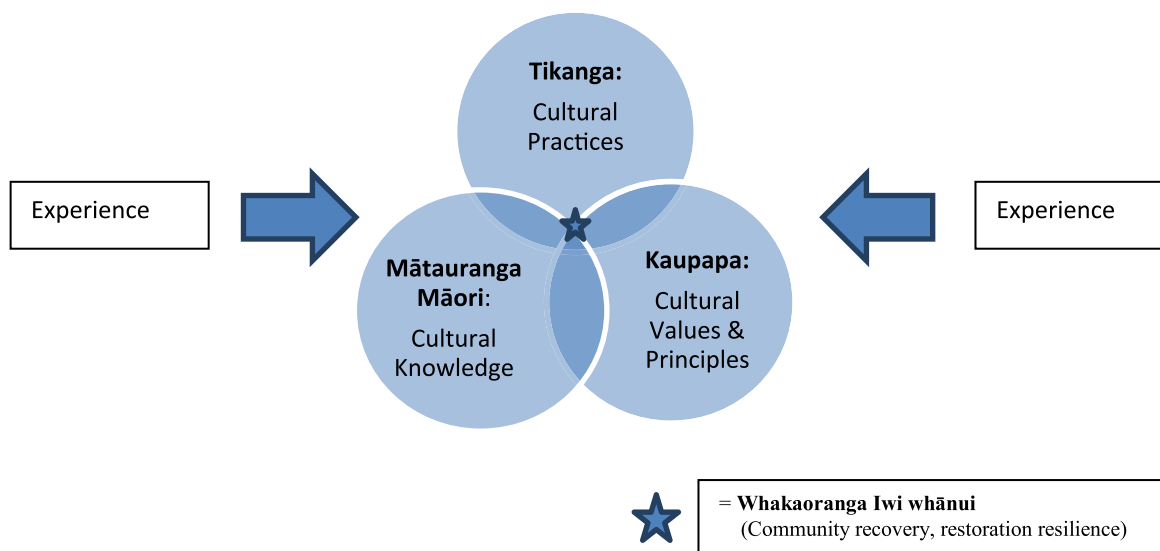


Fig. 1. Conceptualisation of a Māori Cultural Technologies Approach to Disaster Risk Reduction [54].

5. Recommendations and conclusion

Communitarian forms of adaptive capacity associated with helping others, securing external resources and accessing and utilising assistance from government agencies [24] may be identified in the Māori Recovery Network's response to the Christchurch earthquakes. The Network supported the mainstream response by providing human and material resources, securing government funding and liaising with responding agencies in order to provide support to communities impacted by the earthquakes. The presence of forms of social capital that are associated with enhanced adaptive capacity enabled the Network to provide a rapid and comprehensive emergency response. Forms of self-efficacy that were used to support the community that may be identified in participants' narratives included cooking for others, securing and transporting water and organising to dig liquefaction. In the immediate aftermath of the disaster community capacity was sustained through collective leadership, a sense of community and commitment to place-key principles that are embedded in traditional Māori cultural values such as *whakawhanaungatanga* (building and maintaining relationships) *kaitiakitanga* (guardianship) and *turangawaewae* (tribal authority over a geographical area). One indicator of resilience is the way in which communities are able to capitalise on the new possibilities offered in the post-disaster environment [1]. Te Runanga o Ngāi Tahu has gained statutory recognition in the rebuild and moved to enhance Māori community capacity through addressing social and economic factors, such as poverty, unemployment and poor housing, that were identified by the tribe as increasing vulnerability and eroding resilience in the aftermath of the earthquakes.

Disasters draw attention to the ways in which the social is shaped through relationships between humans, objects and technologies. Drawing upon Actor-Network Theory the Māori Recovery Network may be conceptualised as an Actor-Network constructed through assemblages of actors, artifacts and technologies. *Aroha nui ki te tangata* (extend love to all people) operated as the principal value around which the Māori Recovery Network's response was organised. Cultural values such as *kotahitanga* (unity), *manaakitanga* (hospitality), relationality (*whanaungatanga*) and *rangatiratanga* (leadership) acted as metaphysical actors that guided action. Linkages between state actors, community members, health professionals, NGOs, government agencies, local authorities, buildings, machinery, and essential items, such as food water and clothing, interwove, sustaining the emergency response. Collectively, actor-networks embedded in Māori values, beliefs and practices constitute cultural technologies that mitigate risk and sustain resilience. The following section considers opportunities as well as tensions relating to the integration of Māori capacities and capabilities within national and regional emergency preparedness and response frameworks.

The inclusion of Ngāi Tahu in legislative frameworks surrounding the Christchurch recovery may be regarded an example of best practice in relation to the principles of the Treaty of Waitangi and the Hyogo Framework for disaster risk reduction both of which encourage coordinated action within and between government agencies and the community. The potential contribution of cultural groups to emergency response initiatives was highlighted in the formation and operation of Māori Recovery Network following the February 22, 2011 Christchurch earthquake. The challenge is to use lessons learnt from Christchurch to improve risk management and disaster mitigation processes and to maintain readiness for emergency response and recovery by and for Māori communities across all sectors. To date Māori resources and cultural strengths have not been integrated into pre-disaster planning and emergency response strategies at the national and regional levels in any meaningful way. Conversations with regional

emergency managers in Canterbury and Wellington have indicated a willingness to include local Māori in disaster preparedness and response planning. However, at the present time there is both a lack of human capacity as well as understanding about how to engage in this process. At the community level an emphasis on individualised emergency preparedness and response is also counterproductive to the development of strategies that are inclusive of communitarian cultures [55]. Current practices therefore highlight concerns about the applicability of existing models of resilience that focus upon the individual [56]. The introduction of a values-based approach to national disaster preparedness planning, that draws upon traditional Māori knowledge and practices, would have broader relevance for Māori *whanau* (families), *hapu* (kinship groups) and *Iwi* (tribes), as well as enhance existing disaster risk reduction capabilities.

Evidence presented in this paper suggests that the Māori community-led response to the Ōtautahi earthquakes echoes the priorities and strategies for disaster risk reduction as outlined in the Hyogo Framework for Action. A nationalised Māori 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. Cultural attributes including Māori knowledges, values and practices interwove to create moral and relational technologies that when collaboratively operationalised by Māori, facilitated disaster risk reduction. The Māori community's collective initiatives demonstrated how cultural attributes could be utilised to enhance the recovery and resilience of the wider Christchurch community. The prompt and effective disaster risk management approach implemented by Māori has acted as the genesis for increased engagement and collaboration between local Māori, regional civil authorities, government and private stakeholders who are engaged in civil/disaster preparedness planning and urban rebuilding in Christchurch. Despite global advocacy for incorporating cultural diversity as a consideration in the development of disaster risk reduction policy, Māori cultural technologies have not been acknowledged in pre-disaster planning and emergency response strategies at the national and international levels. The researchers recommend that cultural lessons learned from the Christchurch experience should inform and will enhance the future development of civil defence and emergency management strategies and infrastructure in New Zealand. It is anticipated that the communitarian value-based recovery approach adopted by Māori in response to the earthquakes may also have relevance for other nations with indigenous communities and/or similar sets of values.

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