Harnessing indigenous knowledge in disaster risk management in Aotearoa New Zealand

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Abstract

Purpose. This paper will provide an insight into understanding of risks and cultural heritage by local and indigenous communities, as well as their knowledge, values and practices informing the perception of disaster risk management. The aim is to contribute to the implementation of Community Based Disaster Risk Management (CBDRM), which leads to a locally appropriate and locally "owned" strategy for disaster risk management.

Approach. The paper presents experiences in disaster response by local communities in New Zealand Aotearoa and consequent shift in the perspective towards disaster risk management which needs to be reflected in cultural heritage field. Disaster risk management plans can be understood as series of written policies and procedures that prevent or minimize damage resulting from disasters, tailored to a museum's, library's, archives or community's specific circumstances and facilities. Having a disaster management plan is not an end result, in itself. The process of creating, implementing, and updating a plan can be far more important and beneficial to an institution or community.

Value. At-risk communities are actively engaged in the identification, analysis, treatment, monitoring and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capabilities. This means people are at the heart of decision-making and implementation of disaster risk management activities. This aligns with a paradigm shift in disas-

ter management from having management agencies as the primary actors, towards wider and deeper stakeholder involvement, especially in the private sector with local level actors.

1. Introduction

Ko te wehenga o Ranginui rāua ko Papatūānuku. Ka puta ki te whai Ao, ki te Ao mārama.

From the separation of [Ranginui] the sky father and [Papatūānuku], the earth mother, first light burst upon the world, and from it came a well-spring of knowledge and understanding.

The creation story of Ranginui and Papatūānuku is a representation of a Māori view of the world – it illustrates an understanding of the environment and through their off-spring, an understanding of the origin of risks.

Each of their children are *ātua* [deities] who govern life in the natural world and are the foundations of *Mātauranga Māori* or Māori knowledge. One of these is Rūaumoko - yet to be born or newly born child representing earthquakes and volcanoes. There are many stories of Rūaumoko - the shaking of the lands is a result of Rūaumoko kicking and moving around; volcanic eruptions are his mother's feeling of unwellness. Geothermal unrest is considered the first sign that Rūaumoko is restless.

People, creatures, and the environment that supports them are considered an extended family. *Whakapapa* is the Māori term for genealogy - a knowledge system that enables Māori to realise their connections. Maintaining relationships is important to maintaining mauri or the vitality of people, creatures, and the natural environment. Knowledge of the natural world, including risks, is passed on through *whakapapa, pūrākau* [stories], *waiata* [songs] and place names.

In 1840, *Te Tiriti o Waitangi/* The Treaty of Waitangi, was signed by the British Crown and Māori chiefs. The Treaty has two texts – one in the Māori language and one in English. Among other things, the Māori language Te Tiriti promises to uphold the authority of tribes over their *taonga katoa.*

Taonga is defined as treasure, anything prized – applied to anything considered to be of value including socially or cultural valuable objects; resources, phenomena, ideas, and techniques[1] . *Taonga* is used to describe Māori cultural heritage and encompasses physical objects, the natural environment, language, and cultural beliefs.

This paper uses the term *taonga* and cultural heritage to consider disaster risk manage-ment context in Aotearoa New Zealand. The paper also considers the change in scope of the term cultural heritage which includes historic cities, living cultural landscapes, gardens, or sacred forests, as well as movable and immoveable items within sites, museums, historic properties and archives and knowledge, beliefs, and value systems (Jigyasu et al. 2013).

In 1975 the Waitangi Tribunal was set up as a permanent commission of inquiry that makes

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[1]   Also see: Te Aka Māori Dictionary available at maoridictionary.co.nz.

recommendations on claims brought by Māori on alleged breaches of the promises made in Te Tiriti o Waitangi Treaty of Waitangi.

In 1991 WAI262 claim was lodged with the Tribunal about policies and laws that were taking away Māori control over taonga. As noted by historian Paul Hamer the claim concerned much more than treaty rights over native species but went to the very heart of what is involved in maintaining Māori culture and identity. This extends to the Crown's control or funding of *mātauranga* Māori (Māori knowledge) across libraries, archives and museums, the regime governing protected objects, education, the arts, broadcasting, and research science (Hamer 2016).

An understanding of *taonga*, as outlined in Article Two of Te Tiriti o Waitangi/Treaty of Waitangi and understood by Māori could provide a more nuanced disaster risk management framework for cultural heritage organisations in Aotearoa New Zealand.

The role of Māori knowledge or *mātauranga* Māori is outlined in King et al. 2007 and they argue for considering this knowledge in hazard identification and management and prevention, while research of Aotearoa New Zealand Community-led disaster management responses draws on the Christchurch earthquakes of 2010 and 2011, and research led by Dr Christine Kenney, Professor of Disaster Risk Reduction, Massey University. Her work with indigenous communities has been internationally recognised as best practice science.

Iwi created disaster risk management publications relate more specifically to environmental resource management issues or climate change policies. While not directly related to disaster risk management, the plans often outline information relating to cultural values and consultation, engagement protocols for resource consents and monitoring, plan changes and matters of significance for the local indigenous population. Examples include the Ngāti Hine Iwi Environmental management plan 2008[2], Te Arawa Lakes Trust Climate Change Strategy[3] and Ngai Tahu Climate Change Strategy[4].

There are very few published examples of collaborative projects between *iwi* and Government on risk reduction initiatives specifically for Māori cultural heritage or taonga. A publication produced in 2003 by Heritage New Zealand Pouhere Taonga and New Zealand Fire Service (now New Zealand Fire Safety) is one example.

A recent project by the University of Auckland led by two Te Arawa descendants examined the readiness of 16 Te Arawa *marae* to deal with the impact of a natural disaster finding them *moderately resilient*.[5]

Increasingly, *marae* become the place of safety for communities' post-disaster. Hudson and Hughes (2007) undertook a case study of a *marae* and Māori communities in the Manawatū during the floods of 2004. The intended outcome was to provide research-based evidence to inform emergency management policy and planning development.

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[2]   For more information see: ngati-hine-iwi-environmental-management-plan-2008.pdf (nrc.govt.nz).

[3]   For more information see: Te Ara ki Kōpū | Te Arawa Climate Change Strategy | Te Arawa Lakes Trust.

[4]   For more information see: https://ngaitahu.iwi.nz/environment/policy/climate-change-strategy/.

[5]   For more information see: Iwi's resilience to climate change | Ministry for the Environment.

2. An Aotearoa New Zealand context and disaster risk management challenges

Whiria te tangata, ka puta te oranga.

Weaving the people together ensures well-being.

Māori perspectives on risk are holistic in that there is no separation of the physical and spiritual world. Disaster risk management approaches need to consider the *pūrākau* that weave together our understanding of the natural world, our place in it and in turn how we understand and care for one another and our cultural heritage. Furthermore, storytelling has always been one of the key ways knowledge was sustained and protected within Indigenous communities (Lee 2009). Dr Daniel Hikuroa, Senior Lecturer in Māori Studies at the University of Auckland provides an example of how risk is codified in *pūrākau*:

> Like other cultures, Māori have serpent or dragon-like creatures called *taniwha*. *Taniwha* can be both guardians and warnings. A *pūrākau* from the Eastern Bay of Plenty describes the Wait-epuru Stream as a *taniwha* who flicks its tail from side to side. For Hikuroa (2017) the presence of a *taniwha* is precautionary and suggests that there is danger associated with the stream.

After large flood events, the low-lying sections of Waitepuru stream often change course moving back and forth from side to side - the metaphor of the *taniwha's* flicking tail starts to make sense.

In 2005, flash floods sent debris down the Waitepuru stream, and it once again shifted course. Many buildings in the Bay of Plenty town of Matatā were made uninhabitable, but none of the three *marae* were affected because of their chosen location (Figure 1). The *marae* is the principle communal space that belongs to a particular *iwi* (tribe) and *hapū* (sub tribe). It is a place of ancestral history and knowledge and a place that can provide social and cultural support for communities impacted by disasters. For Hikuroa this was not by chance. Hikuroa explains how there are literal and metaphorical strands to the story: the *pūrākau* intertwines and codifies knowledge about both geomorphology (landforms) and disaster risk reduction.

The indigenous Māori people of Aotearoa New Zealand have applied traditional knowledge, values, and practices to address disaster-related risks and community recovery during disasters throughout their history. Recent examples of Māori cultural factors facilitating disaster risk management include the response to the Christchurch earthquakes in 2010 and 2011 and the flooding of the Rangitāiki River which inundated 70% of homes in the Bay of Plenty town of Edgecumbe in 2017.

Furthermore, *marae* have played a key role in the community response to natural disasters and civil defence emergencies. Following the 2016 earthquakes in Kaikoura, Takahanga *marae* demonstrated the concept of *whakapapa*, by opening and feeding the community, providing shelter and support to all. Within that it is the recognition that the collective well-being of the community is critical to its recovery.

Qualitative research on Māori response to the earthquakes provided evidence that local Māori responded effectively to facilitate community recovery and resilience. It argued that the knowledge, principles and practices embedded within Māori responses to the Christchurch

Figure 1. *Debris and damaged houses following the 2005 Matatā debris flow*
(Source: Chappell 2013)

earthquakes may be contextually relevant for national and regional policy development in the area of disaster risk management, response and recovery: "[...] risk management initiatives were collaborative, effective and shaped by *kaupapa* (cultural values), specifically the value, the core principle *aroha nui ki te tangata* (extend love to all people)" (Kinney and Phibbs 2015; Phibbs 2015). Christchurch and Edgecumbe provide evidence that the communities, local authorities, and civil society groups have the resources and capacities to deal with disasters, i.e., indigenous knowledge, policies, disaster reduction programs, technical institutions, machinery and equipment, and social networks. These examples show also that nobody can understand local opportunities and constraints better than the local communities themselves.

The article *Ngā Mōwaho: an analysis of Māori responses to the Christchurch earthquakes,* published in 2015, illustrates quite clearly the fallibility of the formal disaster management infrastructure stemming from a lack of understanding of the nuanced, complex, systemic, and local context of a situation. This resulted in difficulties integrating Māori volunteers into the mainstream response which created a sense of isolation and exclusion of the communities during those events (Phibbs 2015). In both cases the relationships [between formal disaster management infrastructure and community] and communication issues resulted in marginalisation of Māori cultural factors. There were enduring barriers to Māori engagement within Civil Defence, illustrated by the lack of Māori representation and tikanga Māori within disaster planning.

3. Paradigm shift in disaster management in Aotearoa New Zealand

The discourse of disaster management has undergone significant change in recent years, shifting from relief and response to disaster risk reduction (DRR) and community-based management (Lattig 2012). Organisations and vulnerable countries which practice DRR

have moved from a reactive, top-down model to proactive, community-focused disaster management. This shift relates to how risks are framed, the main policy tools dealing with these risks, the required knowledge, the main actors, and the multilateral goals related to addressing these risks. In addition, case studies from the Asia and Pacific region suggest that traditional, indigenous knowledge are invaluable for effective community-led responses to natural hazards (Critical guidelines. Community-based Disaster Risk Management 2006; Shaw 2016). Finally, it is recognised that Māori and other approaches to cultural heritage disaster risk management differ in their motivation and extent.

Resilience to Nature's challenges Kia manawaroa - Ngā Ākina o Te Ao Tūroa (2015), a 10-year programme launched in Aotearoa New Zealand, aims to enhance New Zealand's resilience to natural disasters. This includes developing Māori-specific tools and using community-centred approaches to build resilience and enhance *kaitiakitanga* [guardianship] or stewardship of the places that are special to communities.

Furthermore, the concept and application of the term *whakaoranga* for disaster resilience was developed in the *National Science Challenge Resilience to Nature's Challenges' research project: Whakaoranga marae* and included in *National Disaster Resilience Strategy Rautaki ā-Motu Manawaroa Aituā* (2019). The Strategy is informed by policy and practice across key sectors of society and promotes resilient practices in each of these sectors. It considers the value of Māori *kaupapa*-based technologies for shaping contextually relevant disaster risk management strategies (Graph 1).

The *whakaoranga* process is underpinned by *kaupapa* Māori (cultural values), informed by *mātauranga* Māori (cultural knowledge and science) and carried out as *tikanga* Māori (cultural practices). *Tikanga* are related to cultural identity and expression, they are ethical and values-based and imply accountability and transparency. These cultural attributes interact to create community and environmental resilience in the context of disasters. It is important to note that it encompasses all communities and parts of New Zealand impacted by disasters (Graph 2).

Graph 1. *The policy context of the National Disaster Resilience Strategy* (Source: National Disaster Resilience Strategy Rautaki ā-Motu Manawaroa Aituā 2019)
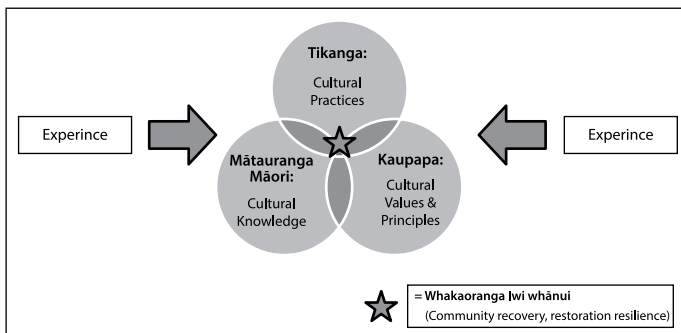
Graph 2. *Conceptualisation of a Māori Cultural Technologies Approach to Disaster Risk Reduction* (Source: Kenney and Phibbs 2015)

Mātauranga means using scientific, historic, local, and traditional knowledge while striving towards a common understanding. It is also stimulation of communication keeping in mind that diverse groups receive information differently. Based on a long and close association with the land and its resources, Māori have developed an extensive knowledge of local natural hazards (King 2007). This includes oral histories and traditions that record past catastrophic events. Complex information is passed on through stories and reinforced through powerful imagery, including place names that designate high-risk areas, and environmental changes that indicate if activities are safe.

To that end, the qualitative Māori research methodology, *Te Whakamāramatanga*, has shaped community-based project design and implementation (Kinney and Phibbs 2015). The foundational concepts of this methodology include *whakapapa* (genealogy, continuity); *whakawhanaungatanga* (building relationships); *whakarurutanga* (safety), *whakaaetanga* (acceptance, agreement, consent); *whakaritenga* (negotiation); *whakangungu* (protection, advocacy); *whakawhirinaki* (building trust); *whakamana* (empowerment); *ōritetanga* (equity), and *manamotuhake* (autonomy, self-determination). Although the methodology was developed in the health field, current research projects have extended its applicability to the fields of natural hazards, and disaster research.

Climate risk management in Aotearoa New Zealand uses a *whare* [house] model. It is based on the understanding that not all community knowledge is captured in historical data. The *whare* represents not only current knowledge, but wisdom of the past and our evolving understanding of the world, which should inform how we approach (climate) risk and data analysis (Sweeney 2021). The *whare* model provides different starting points to engage with *mātauranga* Māori. These include guidance on collecting information on governance and leadership enhancing data led decision-making and arranging this information. It is considered a model for an integrated *mātauranga* Māori and western approach.

On February 8, 2022 a protest against New Zealand's COVID-19 protection measures took place on the grounds of New Zealand's Parliament. The National Library of New Zealand and Archives New Zealand buildings are situated less than 500 metres from Parliament. The occupation lasted 23 days and the Library and Archive buildings were closed to the public to protect the buildings, staff, and collections (Figure 2).

Managing and responding to the risks posed to buildings, people and collections was overseen by the Department of Internal Affairs Incident Management Team (IMT). Department of Internal Affairs has six branches including Te Tāhuhu Iringa Kōrero – Information and Knowledge Services branch. Within this branch is National Library of New Zealand Te Puna Mātauranga o Aotearoa and Archives New Zealand Te Rua Mahara o e Kāwanatanga.

Figure 2. *The police clash with protesters as they remove tents and camping equipment from the occupation site on Wednesday. National Library of New Zealand building can be seen in the background.* (Source: Parliament protest: The siege might be over, but the propaganda war is just beginning | Stuff.co.nz, photo by Branden Fastier)

The IMT objectives were outlined on Department of Internal Affairs intranet site, 1840:

1. Ensure the safety and wellbeing of our people. This includes kaimahi (staff), customers, visitors and any members of the public who are on and around our sites.
2. Ensure the security and protection for taonga, buildings and infrastructure.
3. Maintain the delivery of services and support for New Zealanders.
4. Maintain our involvement in an all of Government approach/response.

Following the 23-day protest, National Librarian, Rachel Esson, invited staff to participate in a *karakia* (Māori ritual for seeking spiritual guidance and protection).
"We would like to conduct a special *karakia* to synchronize our thoughts and feelings. In doing so, we seek to acknowledge the disruptions affecting each of us in our personal and professional lives. We welcome you all to attend and share your *mauri* (life force) to enhance the *kaupapa* (purpose) and intentions of our *karakia*." (Rachel Esson, 2022, email to National Library of New Zealand staff, 4 March, 2022).
The mauri of people and taonga was articulated and a culturally responsive action taken by the National Librarian.

4. Discussion

Current international disaster risk management models and theoretical frameworks understand that comprehensive disaster risk management plans need to be formulated based on the specific characteristics of cultural heritage and the nature of hazards within a regional context. They need to take into account historic, aesthetic and other values of cultural heritage. At the same time, they need to address regional developmental and social challenges and think about stakeholder and community engagement from the outset. The understanding that it is necessary to enable strategic partnerships and initiatives that bring the knowledge and capacities of communities in the fields of cultural heritage and disaster risk

together, and applying people-centred approach to managing disaster risks on is reflected through different publications and training activities of the International Council on Monuments and Sites (ICOMOS), United Nations Office for Disaster Reduction (UNISDR), (United Nations Educational, Scientific and Cultural Organization) UNESCO, International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) and others (Jigyasu 2010; Jigyasu 2011; Jigyasu et. Aal. 2013; Tandon 2018; Higgins and Douglas 2020). However, looking at these models and frameworks from the *whakaoranga* perspective and in the context of Aotearoa New Zealand, it is evident that (with exceptions) they place their emphasis on the existing technical perspectives and understanding of disaster risk management. It is unclear what greater recognition, understanding and integration of *iwi*/Māori perspectives and *tikanga* in disaster risk management – before, during, and after an event would imply.

It is also assumed that external agencies: government, non-government organizations, specialists, administrators, and policy makers will initiate and implement community level programs before and after disasters. Their focus is usually on technical areas and data-centric systems, therefore, such initiatives often end once the external support is gone, caused by lack of partnership, participation, empowerment, and ownership by local communities.

In addition, the process of disaster risk planning for cultural heritage requires significant resources to cover all the required elements of a plan, such as a comprehensive risk assessment, assembling and training an emergency team, preparing evacuation routes and emergency signage, the provision of emergency equipment, proposals and protocols for the evacuation of people and salvage of heritage objects, etc.

Nevertheless, the shift to proactive, community-focused disaster management in Aotearoa New Zealand implies the need to understand how Māori disaster response frameworks may innovate and enhance formal disaster management strategies and response mechanisms. *Kaupapa*-based, Māori research reflects a bottom-up approach to disaster risk management requirements. It is designed by and for Māori, addresses Māori concerns, is conducted predominantly by Māori researchers, and is based on Māori cultural values. Starting with *mānaakitanga*, and the core principle of *aroha nui ki te tangata, kotahitanga* [unity] implies engagement, communication, sharing experiences and collaboration. This collective action is a *kaupapa* which, when implemented, reflects the capability of local people to initiate and sustain their own disaster risk management (Graph 3).

Cultural heritage disaster risk management requires a change in perspective from the foundational concepts of the disaster risk management methodology and suggested frameworks. For example, a sample plan for *marae* emergency preparedness suggests that the community has the capacity to become "a team or committee to develop the disaster plan," share their knowledge on the possible impacts of natural disasters and to recognise who the key people that could be called upon in an emergency are. In that sense "outlining emergency response, establishing chain of command and appointing emergency coordinator(s)" is done collaboratively. It is necessary to understand that all communities have vitally important assets to deal with disasters. These include knowledge of disaster warning signs, locally safe and vulnerable areas, experience of past disasters, methods of survival and social relations. Therefore, establishing preventive measures, preparing for disaster, and taking risk management measures are activities attained using risk-based land use planning, and building relationships with the wider community, council and land use and development planners.

The Māori worldview and *tino rangatiratanga*, a values-based leadership implying self-determi-
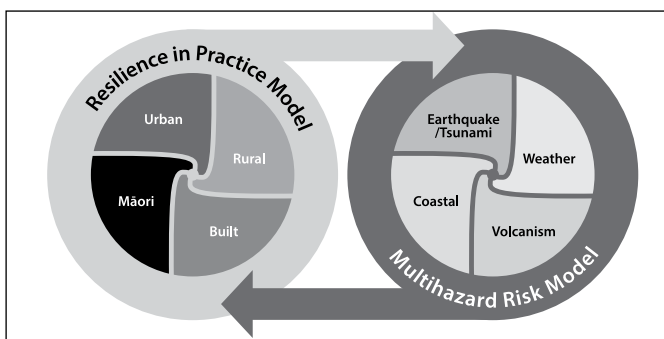
Graph 3. *The structure of the phase 2 Resilience Challenge* (Source: Resilience to Nature's challenges Kia manawaroa - Ngā Ākina o Te Ao Tūroa 2015)

nation, support the notion that while the role of local government, the private sector and NGOs is important, the primary responsibility of grassroots development lays with local leadership.

5. Conclusion

Policy makers, scientists, and various non-indigenous communities recognize that community involvement in disaster risk management is key to the sustainability of community level initiatives for disaster management. That corresponds to the general elements of the bottom-up approach to community-based disaster risk management which is based on the understanding that local people can initiate and sustain their own community development. Furthermore, the responsibility for change rests with those living in the local community, and repeated community success is a powerful factor in continuing local initiatives. A successful, bottom-up strategy will include broad-based local participation in comprehensive planning and decision-making activities that promote action. The emphasis is on improving the utilization and management of local resources, creating needed educational opportunities, and utilizing outside financial assistance as required. Community members and groups within a community may have different perceptions of the risks and vulnerabilities of their cultural heritage. This is reflected in the recognition that the concept of heritage and what is worth preserving is underpinned by different values and morals. Moreover, it is considered that nobody can understand historic, aesthetic and other values of *taonga*, of cultural heritage than the local communities themselves.

Therefore, there is a necessity to acknowledge that indigenous and community knowledge and practice should become the foundation for developing a site-specific, cultural heritage risk management framework.

For example, Aotearoa New Zealand's national institutions, the National Library of New Zealand, Archives New Zealand; Te Papa Museum of New Zealand are all located in Wellington, very close to Wellington Harbour, Te Whanganui-a-Tara. Story from this area is that the Harbour was formerly a lake cut off from the sea and occupied by two *taniwha* Ngake and Whātaitai. Ngake felt he had outgrown his lake home and thrashed his way out, breaking up the cliffs to form the harbour. Whātaitai was not so keen but followed only to become stuck on the low tide, forever stranded to form the land around what is now Wellington airport. Are these stories of past disasters? Could these institutions integrate a more people-centred approach to their disaster risk management strategies by working with communities to understand the stories of the places on which the buildings sit and collections reside?

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Sažetak

Tradicionalni sustavi znanja u menadžmentu rizika od katastrofa na Novom Zelandu

Cilj. Planovi za menadžment katastrofama mogu se shvatiti kao niz pisanih smjernica i procedura koje sprječavaju ili umanjuju štetu koja je rezultat katastrofa, prilagođenih specifičnim okolnostima muzeja, knjižnice, arhiva ili lokalne zajednice. Posjedovanje plana menadžmenta katastrofama nije samo po sebi krajnji rezultat. Proces kreiranja, implementacije i ažuriranja plana može biti daleko važniji i korisniji za instituciju ili zajednicu.

Pristup. Zajednice izložene riziku aktivno su angažirane na identifikaciji, analizi, tretmanu, praćenju i procjeni rizika od katastrofa kako bi umanjile svoju ranjivosti i unaprijedile svoje sposobnosti. To znači da su ljudi u središtu donošenja odluka i provođenja aktivnosti menadžmenta rizikom od katastrofa. To je u skladu s promjenom paradigme u području menadžmenta katastrofama i izvanrednim situacijama, od načela da je menadžment organizacije primarni akter, ka široj i dubljoj uključenosti zainteresiranih strana, posebno u privatnom sektoru s akterima na lokalnoj razini.

Vrijednost. Ovaj rad pruža uvid u to kako lokalne i autohtone zajednice sagledavaju rizike i kulturno nasljeđe, kao i uvid u njihovo znanje, vrijednosti i praksu, na kojima se zasniva njihovo poimanje menadžmenta rizika od katastrofa. Cilj je doprinijeti implementaciji menadžmenta rizikom od katastrofa zasnovanog u zajednici (MRKZZ), što vodi lokalno odgovarajućoj i lokalno „posjedovanoj" strategiji za menadžment rizika od katastrofa. Rad će predstaviti iskustva i reagiranje lokalnih zajednica u katastrofama na Novom Zelandu i preokret koji je uslijedio u području menadžmenta rizika, a koji se treba primjenjivati i u području očuvanja kulturnog nasljeđa.

KLJUČNE RIJEČI: menadžment rizikom od katastrofa zasnovan u zajednici (MRKZZ), planiranje u slučaju katastrofe za kulturno nasljeđe, znanje autohtonih zajednica