

## WHAT'S IN THE KETE?

### An inventory of Māori-centred resources for disaster preparedness in Aotearoa New Zealand

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#### Abstract

Māori collectives are drawing from mātauranga and asserting rangatiratanga over disaster preparedness for the wellbeing of their communities. However, long-standing impacts of colonisation have contributed to Māori being disproportionately impacted by disasters, and to a lack of knowledge concerning the existence and availability of Māori-centred disaster risk and resilience (DRR) tools that help whānau prepare. Two key findings were drawn from a desktop literature review and thematic analysis. Firstly, government DRR policies and guidelines in Aotearoa New Zealand which reference te Tiriti o Waitangi or the Treaty of Waitangi rarely refer to DRR knowledge exchange with Māori communities or Māori-centred DRR tools. Secondly, there are some Māori-centred DRR education tools being created by collaborative teams either led by or partnering with Māori. However, many of these tools are hard to find, and there is little evidence to indicate their impact, uptake and sustained resourcing. The authors discuss these findings, current barriers to uptake, and present further research opportunities.

#### Keywords

disaster risk and resilience (DRR), disaster preparedness, DRR communication, education tools, Māori-centred

#### Mihimihi

This research is guided by the following whakataukī:

Kotahi karihi nāna ko te wao tapu nui a Tāne.  
*The creation of the forests of Tāne comes from one kernel.*

—Professor Te Wharehuia Milroy CNZM QSO

Ka nui te mihi e aku rakahau kua auaha ngā ara ki tēnei wāhi rakahau ki āhei i ngā rakatahi kairakahau. Ka nui tā tātou aroha mō tō koutou māia ki te hāpai i ngā mātauraka e pā ana ki te manawa ora, me haumarua o ngā hapori Māori puta noa i ngā motu kei roto i te ao hurihuri.

Nō Te Waipounamu a Ruby, he uri ia nō Kāi Tahu, Kāti Māmoe me Waitaha.

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Nō Wharekauri a Kristie-Lee, he uri ia nō Ngāti Mutunga o Wharekauri me Te Āti Awa.

He rakatahi kairakahau rāua, kei te hiahia rāua i te āwhina mō ngā kaupapa haumaruru e haere ake nei.

Nō reirā, tēnā koutou, tēnā koutou, tēnā tātou kātoa.

The authors of this article give thanks to all who have fashioned pathways and created this research space to enable other emerging researchers. We greatly acknowledge your courage and determination in uplifting knowledge surrounding the wellbeing of our communities in this forever changing world. The authors are early career Māori researchers from Te Waipounamu and the Chatham Islands, respectively. They aspire to support the momentum of kaupapa uplifting community resilience.

## Introduction

Disaster risk and resilience (DRR) is a part of Indigenous knowledge systems worldwide, a knowledge which has been well recognised in global strategies since the mid-1990s (Lambert & Scott, 2019). The Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR) explicitly notes and encourages utilising Indigenous knowledge in DRR practices and policies (United Nations Office for Disaster Risk Reduction [UNDRR], 2015). The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) acknowledges the collective rights of Indigenous peoples as paired with rights of individuals (United Nations [UN], 2008). UNDRIP therefore acknowledges the right to mana motuhake for Māori, the Indigenous peoples of Aotearoa New Zealand. The declaration states that Indigenous peoples have “the right to revitalize and transmit to future generations their histories, language, oral traditions, philosophies, writing systems and literatures, and to designate and retain their own names for communities, places, and persons” (UN, 2008, Article 13.1) as well as “the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning” (UN, 2008, Article 14.1). Despite the rights set out in UNDRIP, long-standing impacts of colonisation and marginalisation have meant Indigenous peoples are often disproportionately impacted during natural disaster events (Howitt et al., 2012; Lambert & Scott, 2019). Education and preparedness are a way forward, but these need to be grounded in cultural knowledge and

created using cultural methodology to be effective (Howitt et al., 2012).

Māori are recognised globally for asserting rangatiratanga over DRR (UNDRR, 2022). Māori have experienced natural processes such as earthquakes, tsunami, volcanic eruptions, severe weather events and landslides over centuries and have adapted their knowledge system, cultural customs and protocols to enhance their resilience (Gabrielsen et al., 2017; Kenney et al., 2023; King & Goff, 2010). Aotearoa is now a multicultural society, but it was founded by te Tiriti o Waitangi | the Treaty of Waitangi between Māori and the British Crown in 1840. New Zealand is a signatory to the SFDRR, which highlights the importance of education in resilience (UNDRR, 2015). In accordance with te Tiriti and the SFDRR, the previous Labour-led government sought to achieve aspirations detailed within UNDRIP (Te Puni Kōkiri [TPK], 2022). However, under the Equal Citizenship section of the Coalition Agreement between the National Party and New Zealand First, “the Coalition Government does not recognise the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) as having any binding legal effect on New Zealand” (New Zealand National Party & New Zealand First, 2023, p. 10). This raises concerns around the new government’s position concerning the rights of Indigenous peoples.

The need to enhance community resilience and disaster risk awareness throughout Aotearoa when we are facing increased threats due to climate change is of national regard (New Zealand Government, 2018, 2019). In January 2023, Tāmaki Makaurau, Te Tai Tokerau and Waikato experienced unprecedented precipitation and flooding, following which Māori were quick to mobilise personnel to help on the ground and make marae available for whānau in need (Bush International Consulting, 2023). Only a month later, Te Ika-a-Māui was hit by Cyclone Gabrielle, with rural Māori communities throughout Te Matau-a-Māui, Te Tai Rāwhiti, Te Tai Tokerau and Te Tara-o-te-Ika-a-Māui being among those hit hardest (Harrington et al., 2023). Māori have long been underrepresented in mainstream disaster risk preparedness (Kenney & Phibbs, 2015) despite their consistently effective responses to disaster events, something which emphasises the value of weaving Indigenous knowledge into DRR education and communication.

DRR in Aotearoa aligns with global DRR theory, which is rooted in Western science (Kenney et al., 2023). Consequently, DRR concepts, including

hazards, exposure, vulnerability, readiness, response, disaster risk, recovery and resilience, are communicated using this perspective, and DRR tools and resources are designed with this lens (Kaiser & Boersen, 2020). Furthermore, the current organisation of Aotearoa's DRR system into Four R's: Risk Reduction, Readiness, Response and Recovery (New Zealand Government, 2019) is compartmentalised and may not align with Māori perceptions of DRR, potentially creating barriers to partnership, engagement and knowledge exchange, most notably in the Reduction and Readiness phases, for which there is limited Māori-led research.

This article considers "Māori-centred" tools and resources as being made through processes undertaken by Māori researchers and research partners for the benefit of Māori communities using a Kaupapa Māori (by Māori, for Māori) research approach. This approach addresses Māori concerns and is undertaken by Māori researchers, holding kaupapa and mātauranga Māori at the centre of all research processes (Kenney et al., 2023; L. T. Smith, 2015). DRR education and communication tools are critical in initiating dialogue and necessary relationships between those who respond to disasters, including community members, iwi and hapū, first responders, and mandated agencies (Gabrielsen et al., 2017; Kenney et al., 2015). However, it is not yet clear what is being done to improve Māori disaster preparedness and resilience, as DRR knowledge creation and exchange with Māori communities and organisations is limited (Blackett et al., 2021; Gabrielsen et al., 2017). Mainstream DRR approaches taken by the Crown, such as the Four R's approach, have diminished the importance of mātauranga Māori and iwi communication and education methods, inhibiting the resilience of iwi/Māori communities (Gabrielsen et al., 2017).

The purpose of this research was to identify existing and available education tools and resources that focus on DRR knowledge exchange with and within Māori communities; record their diverse purposes, creators and target audiences; and identify the challenges or learnings in the process of their creation in order to evaluate gaps and determine what further research is required. This project also sought to understand the extent to which government strategies, policies, regulations or other incentives are driving the creation of these tools and resources, and in this way begin a discussion about future opportunities to support further knowledge exchange and generation

of Māori-centred DRR education and preparedness resources.

### **Mātauranga Māori and DRR**

Māori have extensive knowledge surrounding DRR (Kenney et al., 2023; King & Goff, 2010), which has not been well recognised in Aotearoa's conventional DRR tools and practices (Kaiser et al., 2020). "Mātauranga Māori" is a term that refers to the overarching system of Māori Indigenous knowledge (Durie, 2003, 2017), the connections between the land, whānau and the whole of the natural environment (Repia & Bailey, 2021). It is an ever-evolving system, which Tā Hirini Moko Mead (2003) explains as encompassing "all branches of Māori knowledge, past, present and still developing" (p. 305).

There is growing recognition of mātauranga and increasing Māori scholarship in DRR, although published literature remains limited. Kenney and Phibbs (2015) state that Māori approaches to disaster and risk reduction are underpinned by mātauranga Māori, tikanga and Kaupapa Māori, with whakaoranga iwi whānui as the outcome sought. King and Goff (2010) explain that the term "mātauranga taiao", which encompasses Māori knowledge of natural hazards and DRR, and is inherently linked with mātauranga Māori, has a broader meaning than "disaster risk". It is evident Māori have their own knowledge generation and transition methods around disaster risk that are adaptable to societal and environmental changes and need to be considered in mainstream DRR.

Iwi and hapū use oral traditions and stories as tools to transfer mātauranga, drawing on local understandings to adapt and revitalise this living knowledge base through the generations (King & Goff, 2010; King et al., 2007). For example, pūrākau are a traditional method of storytelling (King & Goff, 2010), along with pepeha, whakataukī, mōteatea and waiata (King et al., 2007). Knowledge was also transferred via place names and visual methods including whakairo, tukutuku and pouwhenua (King et al., 2007; Repia, 2018; Royal Society Te Apārangi, 2021). Many of these stories and methods communicate risks, potential impacts, and how to reduce risks, and often involve incidents with taniwha and co-occur with breaking tikanga or tapu practices, resulting in increased severity of impacts (King & Goff, 2010). Tapu was often placed on areas, actions or objects to discourage certain behaviours, reducing risk to both people and the environment (King et al., 2007).

The intergenerational transmission of knowledge is common to many Indigenous peoples and is used to accumulate and refine knowledge obtained through past experiences of natural events (Lambert & Mark-Shadbolt, 2021). Through these intergenerational experiences and stories, communities develop a deeper knowledge concerning these natural events, resulting in more effective rohe-specific risk reduction through time (King & Goff, 2010). Utilising oral traditions and pūrākau supports whanaungatanga and creates a space for Māori research to be represented and communicated with and within Māori communities (Kaiser et al., 2020). Having spaces where Māori can contribute their perspectives and knowledge, and be not only heard but understood, is greatly needed in DRR (Lambert & Mark-Shadbolt, 2021).

### Education and DRR

In te ao Māori, tamariki and rangatahi are considered critical and precious agents for knowledge creation and exchange (Lambert & Mark-Shadbolt, 2021). The consideration of tamariki and rangatahi in Western emergency management, which is driven from the top down by central and local government DRR communications, is very limited (Kaiser & Boersen, 2020; Kaiser et al., 2020). Disaster education tools and media aimed at the public have traditionally been targeted towards adults. This has begun to change in recent years to incorporate disaster education in schools and youth programmes (Johnson et al., 2014; Kaiser & Boersen, 2020). Hazard education programmes in school settings have been found to increase risk awareness and knowledge in children, especially when these tools are interactive, can be discussed and applied at home, and include relevant actions children themselves can take to be more prepared (Ronan & Johnston, 2001).

Aotearoa is growing proficiency in the DRR education space, with research showing that interactive, action-based DRR education and communication tools can be effective in increasing community preparedness (Vinnell et al., 2020). DRR education tools discussed in this article encompass knowledge exchange tools and resources in both formal and informal education settings, with the purpose of achieving Priority 1 (Understanding disaster risk) of the SFDRR (UNDRR, 2015). Currently, many DRR education tools have been created for a generic audience (Kaiser & Boersen, 2020) and privilege Western scientific discourse (Howitt et al., 2012). However, as Harmsworth and Raynor (2005) explain, there is a difference in how people of different cultures

understand, interpret, perceive, assess and manage information regarding disaster preparedness. Therefore, bespoke education tools designed by and for Māori may be more effective in communicating DRR information to, and engendering action among, Māori (Kaiser & Boersen, 2020).

### Current happenings in the Māori DRR education space

In recognition of Māori responses to recent earthquakes and flooding (Bush International Consulting, 2023; Kenney & Phibbs, 2015), the recent National Disaster Resilience Strategy aspires to build relationships with Māori representatives as well as to recognise and integrate Māori perspectives (New Zealand Government, 2019). However, in contrast, the Civil Defence Emergency Management (CDEM) Act 2002 makes no mention of Māori (Department of Prime Minister and Cabinet [DPMC] & National Emergency Management Agency [NEMA], 2020). Any acknowledgement of Māori in more recent emergency management legislation is limited to merely “considering” the knowledge and advice, recommendations and perspectives of Māori (New Zealand Government, 2018, 2019).

The present DRR framework for allowing Māori to exercise tino rangatiratanga (Te Tiriti o Waitangi [Māori version], 1840, art. 2) and ōritetanga (Te Tiriti o Waitangi [Māori version], 1840, art. 3) is still inadequate (Bush International Consulting, 2024; Kaiser & Boersen, 2020; NEMA, 2021). As noted above, national strategies and monitoring tools were being reviewed under the previous Labour-led government to work towards achieving aspirations set out in the UNDRIP (TPK, 2022) and respond to recommendations from the Ministry of Civil Defence and Emergency Management (MCDEM)'s Technical Advisory Group (MCDEM Technical Advisory Group, 2017). Furthermore, an Emergency Management Assistance Team had been established, which had the opportunity to enhance the proficiency of Civil Defence's engagement with iwi. The team included experienced public information managers with the capability to engage with Māori (MCDEM, 2019). However, a limitation of this system reform is a lack of research around DRR knowledge exchange and risk communication for and with Māori communities and Māori-centred DRR education tools. On 8 May 2024, the Emergency Management Bill 225-1 (2023) introduced under the previous Labour-led government to replace the CDEM Act (2002) was discharged by the present government. Some of the purposes



of this bill were to recognise and enhance the role of Māori in emergency management, providing financial mechanisms for funding iwi for their role in emergency management and requiring Māori membership on “Emergency Management Committees and Emergency Management Co-ordinating Executives”. It also contained a section pertaining to the Crown’s responsibility under te Tiriti o Waitangi. With the discharging of this Bill, the opportunities for tino rangatiratanga and ōritetanga remain uncertain and the need for research-informed decisions is amplified (Gunson & Perese, 2024).

### Methodology and methods

This research was led by Māori authors guided by Kaupapa Māori research values, including whakapapa, rangatiratanga and tikanga (Pihama, 2015; Ratima & Wikaire, 2021; G. Smith, 1992; L. T. Smith, 2015) within the bounds of a limited project scope. The intent of this research was to support notions of rangatiratanga by providing information to uplift other projects and policy changes that support Māori aspirations around DRR knowledge exchange and DRR education tools.

The availability, design scope and limitations of current Māori DRR tools and communication methods with and within Māori communities were analysed through a desktop review of academic and grey literature. Material reviewed included peer-reviewed literature, online material such as government and iwi websites, iwi management plans, Aotearoa risk reduction policies and guidelines, and relevant case studies to gain insights into DRR communication tools and resources currently available which are centred around Māori communities.

To identify references to te Tiriti or Māori in government-level documents relating to DRR in Aotearoa, we searched for the following keywords: “Tiriti o Waitangi”, “Treaty of Waitangi”, “Māori”, “iwi”, “hapū” and “whānau.” Hits were limited to one per sentence as “Māori”, “iwi” and “hapū” were often used repetitively. Any mentions in titles, footnotes, appendices or references were not included as they were not regarded as making a relevant contribution to this assessment. Target audiences for Māori-centred DRR education and communication tools were categorised as either experts (defined as DRR professionals/officials/managers), adults (public), kaumātua, rangatahi and/or tamariki. This formed the basis for creating an inventory of available Māori-centred tools and resources to inform future work and research.

### Results

Seven out of the 10 government-level documents reviewed in this research relating to DRR in Aotearoa contained mentions of Māori in discussions surrounding communication methods or education tools. Total mentions of Māori in government-level documents relating to DRR in Aotearoa ranged from 0 to 54, while the number of key extracts pertaining to Māori-centred DRR communication or education tools ranged from 0 to 2 per document. Where Māori are mentioned, the need for improved relationships and effective communication with and within Māori communities is a recurring theme, especially in documents published from 2018 onwards.

As Table 1 shows, only three of the 10 government documents reviewed make reference to te Tiriti. In documents written before the release of the updated National Disaster Resilience Strategy in 2019, there are no references to te Tiriti. Two documents published in 2019 and 2022, respectively, do not mention te Tiriti either (MCDEM, 2019; NEMA, 2022). Recent revisions and alterations to policies and plans regarding DRR specify the need to engage, consider and collaborate with Māori across the emergency management system (NEMA, 2021; New Zealand Government, 2018). However, there is little guidance on how to collaborate across different units of modern Māori society (i.e., whānau, hapū, hāpori, iwi and Māori organisations).

Table 2 identifies 14 Māori-centred DRR communication and education tools and resources which have been created for a range of purposes. Nine were created within the past six years, and 11 were designed to increase awareness by sharing knowledge of the processes behind hazards and the risks to communities. Earthquakes and tsunamis were the focus of five, two focused on flood risk, and one on volcanic risk, while each of the remaining six included information on a range of natural disasters. Like mentions of Māori in government-level documents, the number of Māori-centred tools also appeared to increase following the Christchurch and Kaikōura earthquakes, with Kia Takatū being the only tool created prior to 2014.

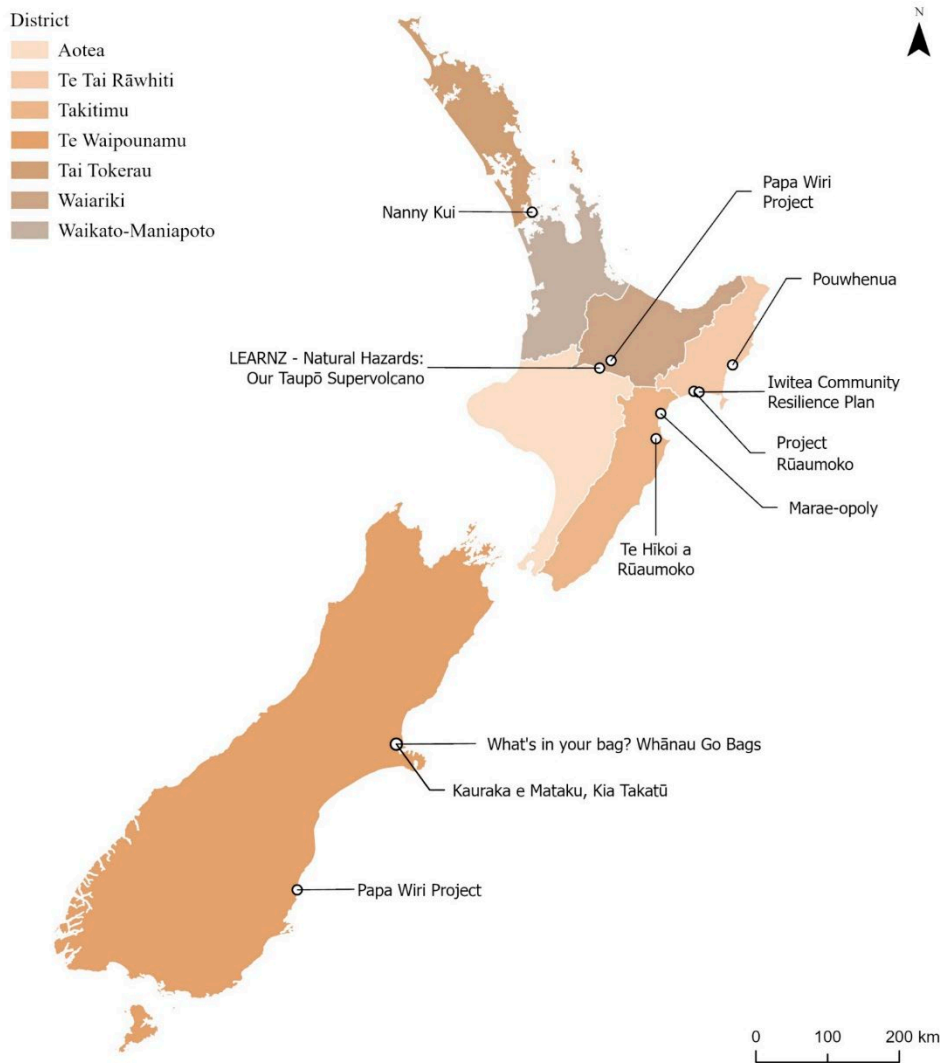
The 14 education tools and resources identified were created for a range of target audiences. Of the 10 that were targeted at tamariki, four were designed to be applied in school-based settings, four were place-based and five were grassroots initiated/community-led. Most of the 10 tools were difficult to find, and there was limited access to the tools themselves. Kia Toka Tōku Ao; Rū Ana, Takatū Ana; and Kia Takatū were

**TABLE 1** References to te Tiriti o Waitangi or mentions of Māori in government-level documents relating to DRR in Aotearoa

Document	Refers to te Tiriti/ the Treaty?	Mentions Māori?	Total mentions	Key extracts pertaining to DRR communication with Māori communities or Māori-centred DRR education tools
Civil Defence Emergency Management Act 2002	No	No	0	N/A
<i>National Disaster Resilience Strategy</i> (New Zealand Government, 2019)	Yes	Yes	54	“It is committed to an inclusive, community approach to resilience. It is focused on putting people at the centre of resilience, including an emphasis on manaakitanga and wellbeing. It aims to build the relationship between iwi and agencies with roles in the emergency management system (before emergencies happen). It also seeks to build recognition of the role culture—including kaupapa Māori and tikanga Māori—plays in our wider resilience” (p. 21).
<i>Consistent Messages for CDEM</i> (NEMA, 2022)	No	Yes	24	“Marae preparedness planning enhances resilience and safety of marae, taonga and iwi, assisting te hau kāinga (the people of the marae) and te haupori (the wider community) to understand and manage their risks” (p. 24).
<i>Emergency Management System Reform: Programme Update</i> (MCDEM, 2019)	No	Yes	5	“The Emergency Management Assistance Team includes experienced Public Information Managers and capability to engage with Māori” (p. 2). “Consider legislative changes or regulations that would require civil defence emergency management consultation with iwi/Māori when planning” (p. 7).
<i>Updating the Legislative Framework to Strengthen New Zealand’s Response to Emergencies—Tranche One</i> [Proactive Release] (DPMC & NEMA, 2020)	Yes	Yes	14	“As part of developing the Government Response, the former Minister of Civil Defence held some discussions with some iwi and marae representatives about the TAG’s recommendations to more fully recognise the contribution of iwi/Māori to effective emergency management. This resulted in the Government agreeing to provide for iwi/ Māori representation on CDEM Coordinating Executive Groups, and to explore a requirement for CDEM Groups to consult iwi on key planning documents, as part its broader response to TAG” (p. 12, para. 67).
<i>Terms of Reference for Ministerial Advisory Committee on Emergency Management</i> (NEMA, 2021)	Yes	Yes	27	“As part of supporting an approach that enables rangatiratanga NEMA looks to improve its ability to enable Māori specific solutions. Specifically, advice provided will ensure that there are no structural boundaries to enabling Māori leadership and engagement across the emergency management system” (para. 9).
<i>Delivering Better Responses to Natural Disasters and Other Emergencies</i> (New Zealand Government, 2018)	No	Yes	22	“We agree that these teams should include experienced Public Information Managers and Strategic Communications experts as required, and the teams should have the capability to engage effectively with local Māori” (p. 28). “Standardising best practice across the response framework, including a full range of communication channels e.g. iwi radio, access radio, social media” (p. 39).
<i>Ministry of Civil Defence &amp; Emergency Management Business Plan 2018–2022</i> (MCDEM, 2018)	No	Yes	8	“The Ministry is committed to strengthening the relationship between Māori and the CDEM stakeholders. Iwi, hapū, whānau, and Māori communities play an important role not only in community resilience building, but also during response and recovery when affected communities may be supported with manaakitanga” (p. 13). “The Ministry will continue to work alongside central and local government to build stronger relationships with iwi, hapū, whānau, and Māori communities to develop strategies for engagement across the 4Rs of risk reduction, readiness, response and recovery and community resilience building” (p. 13).
<i>The Guide to the National Civil Defence Emergency Management Plan 2015</i> (DPMC, 2015)	No	Yes	38	N/A
National Civil Defence Emergency Management Plan Order 2015	No	Yes	17	N/A

**TABLE 2** Available Māori-centred DRR education and communication tools

Māori-centred DRR tool	Creators	Funding source	Purpose	Key audience	Year tool was created
Marae-opoly (Colliar & Blackett, 2018)	Maungaharuru-Tangitū Trust and Tangoio Marae in affiliation with NIWA	Deep South National Science Challenge	Increase risk awareness and identify potential plans to reduce risk of flooding to the marae with climate change.	Rangatahi, adults, kaumātua	2016
Project Rūaumoko (“Collaborative Project Opens Conversations”, 2021)	Ngāti Kahungunu Wairoa Taiwhenua Inc with support from GNS Science and East Coast Lab	Hikurangi Subduction Zone Endeavour Project	Build capacity to create mātauranga Māori based educational tools communicating earthquake and tsunami risk.	Tamariki, rangatahi, adults, kaumātua	2021
Te Hiko a Rūaumoko (Andrews et al., 2014)	Hawke’s Bay CDEM Group, Ministry of Education, Te Puni Kōkiri, Ngāti Kahungunu Iwi Incorporated, Te Ūrunga Waka at the Eastern Institute of Technology and Kahungunu Kōhanga Reo Tari	MCDEM Resilience Fund, Te Hiranga Rū QuakeCoRE	Communicate Ngāti Kahungunu stories of Rūaumoko and increase tsunami risk understanding.	Tamariki	2014
Kia Toka Tōku Ao (House of Science, n.d.)	House of Science—Te Whare Pūtaiao	Unknown	Create an engaging and effective learning environment surrounding earthquakes, earth layers, tectonic plates, and liquefaction.	Tamariki, rangatahi	No date
Rū Ana, Takatū Ana (Te Papa & Toka Tū Ake Earthquake Commission [EQC], 2020)	Toka Tū Ake EQC & Te Papa	Toka Tū Ake EQC	Educational tool for teachers to help students build outcomes to help with the impacts of earthquakes and develop new ways forward.	Tamariki, rangatahi	2020
Kia Takatū (Waho et al., 2008)	CDEM and a working group of representatives from the Māori community	MCDEM	Māori version of “What’s the Plan Stan”, designed as an education tool for teachers and tamariki increasing risk awareness and understanding to be better prepared.	Tamariki	2008
LEARNZ—Natural Hazards: Our Taupō Supervolcano (LEARNZ, n.d.)	University of Canterbury, GNS, Core education and the ECLIPSE program	Commissioned by Toka Tū Ake EQC via ECLIPSE programme	Bi-cultural natural hazards virtual field trip raising risk awareness and identifying steps to increase readiness.	Tamariki, rangatahi	2019
Iwitea Community Resilience Plan (Iwitea Whānau, 2021)	Community of Iwitea in collaboration with Hawke’s Bay Emergency Management Group	Unknown	Foster and increase resilience.	Rangatahi, adults, kaumātua	2021
Te Puni Kōkiri (TPK) Marae Emergency Preparedness Plan (TPK, 2018)	Bay of Plenty CDEM Group, Te Puni Kōkiri and NEMA	Te Puni Kōkiri, NEMA	Increase the preparedness of a marae via a template of personal and resources at the marae as well as what hazards may impact the area.	Adults, kaumātua	2017
Papa Wiri Project (QuakeCoRE, 2020)	Anne-Marie and Benoit Midwood-Murray, Brandy Alger, Kristie-Lee Tamati, Lucy Kaiser in collaboration with Whānau of Te Kapa o Te Rangitika ki Oruanui and Whānau of Ngāti Tūwharetoa, Te Rūnanga o Ngāi Tahu Whānau & Emergency Response Team, Te Rūnanga o Moeraki and others	QuakeCoRE, Toka Tū Ake EQC	Create Māori-centred educational tools and engage with tauwiwi and Māori concerning Aotearoa’s resilience to natural hazards.	Tamariki, rangatahi, adults, kaumātua	2018
Pouwhenua (Repia, 2018)	Harmony Repia, Jo Bailey, and community participants from Tūranganui-a-Kiwa	Joint Centre for Disaster Research Massey University, GNS Science	Master’s research project. Increase tsunami and earthquake awareness in Tūranganui-a-Kiwa through a different medium of storytelling.	Tamariki, rangatahi, adults, kaumātua	2021
Nanny Kui (Te Pāti Māori, 2023)	Te Pāti Māori	Te Pāti Māori	Campaign communicating and educating risk associated with flooding and Cyclone Gabrielle.	Tamariki, rangatahi, adults, kaumātua	2023
What’s in Your Bag? Whānau Go Bags (Ngāi Tahu, 2022)	Te Rūnanga o Ngāi Tahu	Te Rūnanga o Ngāi Tahu	YouTube video communicating what should be in an emergency go-bag.	Rangatahi, adults, kaumātua	2022
Kauraka e Mataku, Kia Takatū! (Te Rūnanga o Ngāi Tahu, 2023)	Te Rūnanga o Ngāi Tahu	Te Rūnanga o Ngāi Tahu	Video campaign to help plan and prepare for emergencies	Tamariki, rangatahi, adults, kaumātua	2023



**FIGURE 1** Distribution of Māori-centred DRR education and communication tools by region

Note: Several tools created for a national audience have not been mapped, including Kia Toka Tōku Ao; Rū Ana, Takatū Ana; Kia Takatū; and the TPK Marae Emergency Preparedness Plan.

simply translations of existing English DRR school resources, as opposed to being specifically centred around Māori schools/communities.

Māori-centred tools appear to have been created by a range of collaborators using various methodologies and creation processes. Most tools appear to have been created in isolation from one another, through short-term research projects driven by Māori researchers with marae and iwi. Exemptions include the Iwitea Community Resilience Plan and Te Hīkoi a Rūaumoko, examples of collaboration between communities and local CDEM groups to generate DRR conversations and plans specific to their area (Gisborne District Council, 2022). The TPK Marae Emergency Preparedness Plan and Nanny Kui were the only central government-led

DRR tools found which were centred around Māori communities. Nanny Kui was developed by Te Pāti Māori as an in-the-moment DRR campaign as flooding events and Cyclone Gabrielle unfolded in 2023 and was well received by the public, judging by the high number of interactions with campaign social media posts (Te Pāti Māori, 2023). The TPK Marae Emergency Preparedness Plan is designed to encourage several key kaupapa central to Māori emergency management and DRR (Royal Society Te Apārangi, 2021), including mana motuhake, rangatiratanga, kaitiakitanga and whakawhanaungatanga.

In terms of geographical spread, most tools have been developed with communities in Te Ika-a-Māui. Most have originated from the East Coast



of Te Ika-a-Māui (Figure 1), again focusing predominantly on earthquake and tsunami risk. There is no documentation suggesting that Te Tairāwhiti was specifically prioritised for tool development based on disaster risk, and the funding sources for these tools are diverse across National Science Challenges, Endeavour Funds, Crown Research Institute strategic funds, emergency management/CDEM funds and Centres of Research Excellence.

However, there are a number of Māori DRR researchers and leaders with whakapapa to the region leading or involved in large research programmes (Awatere et al., 2021; Kaiser et al., 2020; Repia & Bailey, 2021; Tapuke et al., 2023). There are also proactive iwi researchers and representatives (Pohatu & Warmenhoven, 2007) as well as local CDEM groups with active education and outreach programmes and broker capacity through vehicles such as East Coast Lab (Kaiser & Boersen, 2020), all of which may have helped to facilitate these projects.

Most of these tools were created using mātauranga from the involved iwi and kōrero tuku iho of the processes behind earthquakes and tsunamis. The creation of Marae-opoly drew from mātauranga from Tangoio Marae during hui organised and hosted by Maungaharuru-Tangitū Trust. Marae-opoly was based on a shared foundation from which appropriate adaptation pathways could be considered (Blackett et al., 2021). Hui and workshops with iwi members were also used in the creation of the pouwhenua to understand stories from the rohe. Surveys were another common method used to understand communities' risk preparedness and awareness in the beginning stages of making these tools and resources (Repia, 2018). For the remaining tools, project documentation did not disclose the methodology or processes of their creation.

## Discussion

The number of mentions of te Tiriti and/or Māori in governmental documents peaked in 2019, which is likely due to the effective response of Māori to the Kaikōura earthquake (2016) and Edgcumbe floods (2017) (New Zealand Government, 2019). However, this increase was not reflected in the number of mentions of Māori-centred DRR communication or education tools. As can be seen in Table 1, mentions of te Tiriti and/or Māori dropped from the high of 59 in 2019 to 14, 27 and 24 in 2020, 2021 and 2022, respectively.

## Relying on passion projects

Currently, most Māori-centred DRR education tools are being driven by small collaborative teams, hapū/iwi representatives, community groups, Māori students, and early career researchers and their mentors (e.g., Andrews et al., 2014; Iwitea Whānau, 2021; LEARNZ, n.d.; Repia, 2018; Waho et al., 2008). Consistent with the findings of Kaiser and Boersen (2020), these projects are occasionally funded by small and short-term contestable research grants. In the absence of government incentive and long-term investment, these small-scale projects are worth celebrating. However, there appears to be little coordination or strategic prioritisation for these tools in areas that may be more at risk than others (McNaughton & Van Hove, 2014). While larger iwi organisations may have specific Māori-centred tools and resources accessible to them through these collaborations and/or access to funding to create their own, smaller or isolated communities may be left on the back foot in regard to participation in DRR procedures (McNaughton & Van Hove, 2014). These smaller communities are less likely to have either the resources or personnel available to tailor DRR tools to their rohe, making actions and funding at the government level crucial (McNaughton & Van Hove, 2014). This could lead to communities relying on passion projects to effectively include their expectations, needs and practices (Kaiser & Boersen, 2020; Kenney & Phibbs, 2015), as opposed to there being an existing and resourced space for mana motuhake in preparing for disaster events.

Māori-centred DRR education tools are difficult to find, potentially leading to the limited application or assessment of effectiveness outside of their initial programme. Marae-opoly effectively engaged a wide range of audiences and generated risk conversations during its development (Colliar & Blackett, 2018), yet due to project limitations of a short time-frame and limited budget for wider implementation and uptake, there are no further public examples of its use outside of the design stage. Similarly, although teachers were interested in further development and increased distribution of the educational tool Kia Takatū (Renwick, 2012), no evidence of its use was found. In a government-led policy response, however, we would expect to see investment in these resources for wider community uptake. Many of the more recent educational tools, such as Project Rūaumoko; Te Hikoi a Rūaumoko; and Rū Ana, Takatū Ana, focus on earthquakes and tsunamis, aligning with the current educational tools emphasising risk and

awareness of disasters which occur more regularly (Kaiser & Boersen, 2020). LEARNZ (n.d.) was the exception to this, communicating the impacts of volcanoes via an educational virtual field trip. Evaluations have yet to be made of the continued use and effectiveness of these tools, research which is required to support their longevity.

Many of the tools identified were created in collaboration with Māori communities (Andrews et al., 2014; Colliar & Blackett, 2018; Iwitea Whānau, 2021; LEARNZ, n.d.; Ngai Tahu, 2022; Repia, 2018; TPK, 2018; Te Rūnanga o Ngāi Tahu, 2023; Waho et al., 2008), meaning projects were often guided by mātauranga of that rohe as opposed to the homogeneous methods applied at the government level (NEMA, 2022). People are more likely to address risk in their community if prompted by real and recent events (NEMA, 2022) and if these conversations are place-specific (Repia & Bailey, 2021).

Work undertaken by Repia (2018) illustrates an exciting way forward for Māori-centred DRR, utilising pouwhenua as tools for DRR communication. Repia (2018) combined traditional Māori designs representing atua with modern digital elements to create a contemporary, interactive educational DRR tool communicating tsunami risk. Incorporating interactive and visual communication methods such as the pouwhenua provides an opportunity to transform the way disaster risk is communicated (Becker et al., 2019; UNDRR, 2015), increasing the capacity to reach a wide range of audiences as opposed to traditional text-based methods (Becker et al., 2019).

### **Relationships are key in building Māori-centred DRR education tools**

Mana motuhake, rangatiratanga, kotahitanga and other principles of te Tiriti o Waitangi are key kaupapa in developing education tools useful for Māori communities and require relationships between iwi, hapū, communities, researchers, emergency services and officials (Kaiser et al., 2020). However, sustained te Tiriti partnership between iwi and the Crown is required, firstly to develop policy and legislation reframed from a Kaupapa Māori position to guide the development of education tools useful for Māori communities, and secondly to implement other DRR objectives aligned to Māori aspirations. At present, however, there is little mention of sustained te Tiriti partnership in government guidelines. The updated *Consistent Messages for CDEM* acknowledges the necessity of building trust and confidence in the way disaster risk is communicated, yet

the only mention of Māori-centred tools in these communication guidelines is when describing the TPK Marae Emergency Preparedness Plan (NEMA, 2022). Few of the tools identified in this study were made in collaboration with CDEM or NEMA, indicating this legislation and policy gap (Kaiser et al., 2020; Kenney & Phibbs, 2015; Kenney et al., 2015).

The existing and developing Māori-centred DRR tools provide learning opportunities around relationship building, collaboration, and weaving mātauranga Māori and DRR knowledge to inform policy development. However, sustainable resourcing is also required to invest in the collaborative development, updating and reviewing of Māori-centred disaster education tools. Indigenous researchers play a key role in creating a space for Indigenous knowledge to be utilised in environmental knowledge research, exchange and application (Ruru & Nikora, 2021). Iwi researchers and Māori scientists are critical bridges for establishing the relationships required in this space, working to build capability by weaving in Māori perspectives as opposed to integrating mātauranga into pre-existing strategies based on Western science.

Mainstream DRR knowledge creation and exchange has predominantly involved adults (Kaiser & Boersen, 2020), keeping knowledge distribution pathways correspondingly narrow. Broadening DRR communication methods requires including tamariki and rangatahi (Kaiser & Boersen, 2020; King et al., 2007). Tamariki are excellent receptors of information and innovative in creating solutions, and knowledge learned in school is transferred to parents, kaumātua, and the wider community (Kaiser et al., 2020). The significant role played by schools in increasing the risk awareness of whole communities has been widely acknowledged (Johnson et al., 2014; Kaiser & Boersen, 2020; Kaiser et al., 2020; Repia & Bailey, 2021). However, studies measuring the success of school-based DRR communication and education programmes in facilitating disaster risk conversations and application during disaster are limited (Johnson et al., 2014). “Serious games” are also an effective way of facilitating disaster risk conversations among a range of audiences and have been found to help develop knowledge of risk reduction and the ability to consider alternative adaptive pathways (Blackett et al., 2021). More research around this topic is required to collaboratively create new methods to engage, to address the information needs across diverse

communities, to evaluate measures of success and to share these learnings.

### Future work

The whakataukī that guided this research, “Kotahi karihi nāna ko te wao tapu nui a Tāne”, can be interpreted as “Even though something is small, it has the potential to become more.” This research represents a small first step in understanding the knowledge gap around Māori-centred DRR communication and education tools, from which stems a range of opportunities to equip our kete. As this area of research is relatively new and is currently being developed, there will be ongoing projects and publications which are not publicly accessible or published yet. Many iwi tools and resources may also have restrictions on who is able to view and use them as access to mātauranga and Māori risk reduction tools is primarily determined by whakapapa (Mahuika, 2015), a key driver in rangatiratanga and mana motuhake (Royal Society Te Apārangi, 2021). A limited time frame meant the key findings and discussion in this article are limited to the availability of information in the public domain.

Kanohi ki te kanohi communication is a key next step in working with Māori communities and local government to investigate what DRR communication and education tools are needed in their rohe. This form of communication and engagement has been essential in forming strong trusting relationships with and within Māori communities during previous disaster responses (Becker et al., 2019; Kenney & Phibbs, 2015; Kenney et al., 2015). Local government working alongside Māori communities is a key pathway for establishing DRR needs and relationships prior to disasters occurring.

Under the Labour-led government there was significant reform of legislation and DRR policy in Aotearoa which aimed to provide opportunities for collaboration with whānau/hapū/hapori/iwi and Māori organisations to develop and sustain new tools and adapt current ones. This aligned with Articles 2 and 3 of te Tiriti o Waitangi (1840), UNDRIP (UN, 2008) and the SFDRR, to which Aotearoa is a signatory (UNDRR, 2015). Under the new coalition and their recent discharge of the previous government’s emergency management reforms, and the concerning lack of evidence-based decisions (DPMC, 2024), opportunities to remedy shortfalls in regard to Māori rangatiratanga of disaster education are now uncertain. Emergency management policy is needed for Māori to be actively involved in DRR knowledge creation

and exchange from the onset to achieve Priority 4 (Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction) of the SFDRR (UNDRR, 2015). However, government-led engagement with iwi/Māori entities appears to be low, despite Māori desires for greater involvement in planning and arrangements across the Four R’s working alongside local government and CDEM groups (NEMA, 2021). Future studies could be undertaken to better understand the sustained use and evaluation of DRR education and communication tools, which areas should be prioritised, and what lessons have been learned from each of these collaborative projects, with the ultimate goal of producing guidelines or a framework for Māori communities to lead Māori-centred DRR research.

### Conclusion

This research has provided the first inventory of available Māori-centred DRR education tools and resources, and outlined their purpose, creators, target audience and location. Fourteen resources were identified, mostly created in Te Ika-a-Māui by small-scale community-based research projects in collaboration with Māori researchers/organisations, iwi and hapū and targeted towards tamariki and rangatahi. However, little is documented around the key learnings of these projects and sustained use.

This research also highlights the lack of incentive, direction or guidance included in government strategies, policies and regulation in creating Māori-centred DRR education resources. This is concerning considering Māori are among the most impacted during disaster events in Aotearoa and that these events are expected to increase in severity and frequency due to climate change.

As a desktop-based study reviewing literature in the public domain, the findings of this research are limited by the small data sample and scope of the project. To further understand the methodologies being used and the challenges and successes of these tools, further research is required in collaboration with the creators of the tools. Further research is also required to create space for mātauranga-based and Māori-centred DRR communication and education in Aotearoa. The legislative reforms under the previous government provided opportunities for mana motuhake and rangatiratanga of DRR education and preparedness through DRR regulations adhering to te Tiriti o Waitangi. While government-led opportunities for further development of these tools are now uncertain, the majority of existing tools have

been created in response to community needs and research gaps. Future research funds and projects should consider the research gaps highlighted in this article, and keep the following whakatauki in mind:

He iti noa ana, he pito mata.  
*Just a little morsel, but it has not yet been cooked.*

In other words, if the uncooked morsel of the kūmara is planted, it will sprout and grow to produce more. Even though the scope of this research is small, it has the potential to be more.

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### Glossary

Aotearoa	New Zealand
atua	gods
hapū	sub-tribe
hapori	community
hui	meeting/gathering
iwi	tribe
kaitiakitanga	guardianship
kanohi ki te kanohi	face-to-face
kaumātua	elder
kaupapa	topic
Kaupapa Māori	Māori approaches/ practices/principles
kete	basket
kōrero tuku iho	stories of the past
kotahitanga	unity
kūmara	sweet potato
mana motuhake	separate identity; autonomy
manaakitanga	kindness
Māori	Indigenous peoples of Aotearoa
marae	meeting house
mātauranga	knowledge, wisdom
mātauranga Māori	Māori knowledge/ understanding

mātauranga taiao	Māori environmental knowledge/understanding
mōteatea	lament/traditional chant
ōritetanga	equality
pepeha	tribal saying
pouwhenua	land post, traditionally carved from wood marking possession/ jurisdiction over land
pūrākau	legend/story
rangatahi	youth
rangatiratanga	chieftainship
rohe	region
Rūaumoko	god of earthquakes
Tāmakimakaurau	Auckland
tamariki	children
taniwha	water creature/spirit
taonga	treasure
tapu	sacred
tauiwi	foreigner/non-Māori
tautoko	support
te ao Māori	the Māori worldview
Te Ika-a-Māui	North Island (Aotearoa)
Te Matau-a-Māui	Hawke's Bay
Te Pāti Māori	the Māori Party
Te Tai Rāwhiti	East Coast of the North Island (Aotearoa)
Te Tai Tokerau	Northland
Te Tara-o-te-Ika-a-Māui	Coromandel Peninsula
te Tiriti o Waitangi	New Zealand's founding document, meant to be a partnership between Māori and the British Crown
Te Waipounamu	South Island (Aotearoa)
tikanga	custom
tino rangatiratanga	self-government
tukutuku	lattice-work panels
waiata	songs
whakairo	carvings
whakaoranga iwi whānui	community recovery, restoration, resilience
whakapapa	genealogy
whakataukī	proverb
whakawhanaungatanga	establishing relationships
whānau	family
whanaungatanga	relationship

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