



*Knowledge Cultures* 11(1), 2023  
pp. 98–114, ISSN 2327-5731, eISSN 2375-6527

## **Indigenous Knowledge Revitalisation: Indigenous Māori Gardening and its Wider Implications for the People of Tūhoe**

**Natasha Tassell-Matamua**

n.a.tassell-matamua@massey.ac.nz  
Te Kunenga ki Pūrehuroa|Massey University  
Aotearoa|New Zealand

**Teina Boasa-Dean**

indigenoupsychologies@massey.ac.nz  
Ngāi Tūhoe Te Māhurehure  
Aotearoa|New Zealand

**Marie McEntee**

m.mcentee@auckland.ac.nz  
School of Environment,  
Waipapa Taumata Rau|University of Auckland  
Aotearoa|New Zealand

**ABSTRACT.** The revitalisation of Indigenous knowledges is vital to the emancipation of Indigenous peoples worldwide, as well as an increasingly essential component of environmental sustainability. The re-establishment of traditional communal gardening practices and their associated rituals is part of such revitalisation efforts in Aotearoa|New Zealand. We document recent efforts to re-establish the knowledge and practice of communal gardens and the related ritual of māra tautāne in an Indigenous Māori community – Te Māhurehure – in the Rūātoki Valley, Bay of Plenty, Aotearoa|New Zealand. We discuss that, beyond food provision, such revitalisation has a concentric influence of revitalising a range of other Indigenous knowledges for this community.

**Keywords:** Indigenous knowledges; communal gardening; māra kai; māra tautāne; Ngai Tūhoe; Rūātoki; Te Māhurehure; land confiscation; cultural revival

How to cite: Tassell-Matamua, N., Boasa-Dean, T., and McEntee, M. (2023). Indigenous Knowledge Revitalisation: Indigenous Māori Gardening and its Wider Implications for the People of Tūhoe. *Knowledge Cultures*, 11(1), 98–114. <https://doi.org/10.22381/kc11120236>

*Received 1 December 2022 • Received in revised form 1 February 2023*

*Accepted 24 February 2023 • Available online 1 April 2023*

Ko Hine-te-kohurau te ringa whaowhaorangi  
 (The adorning hand of the mist maid in her multiplicity),  
 Takoto whārōrō i te urutapu o Hinewaoriki  
 (Stretching across the sacred expanse of Hinewaoriki's supreme divinity of small shrubs  
 and ferns).  
 Whenua haukura, oneone taurīkura  
 (Tranquil lands, abundant soils),  
 He ahi toi ohomai, te ahi toi whenua momona  
 (Fires that awaken, fires that incite the fat of the land).  
 Pūanga ki te rangi, koia rā te aurei o taumatua  
 (Rigel apparent, the mounds of Io's gardens are heaped),  
 Mahue te waru kaihora a Hinerau Whārangī  
 (Goddess of small shrubs ushes out her season of abundance).  
 Mutu ana te kai a tūpere torongū  
 (Earthen grubs and caterpillars retreat).  
 Taihoa a hōtete tē haramai anō  
 (The horned caterpillar escapes; they will not return).  
 Kia pua a pōananga, titi pouā te kō ki te manawa o Tahuaroa  
 (The white petal heralds the rise of the spade thrust into the bosom of mother nature;  
 New Year is upon us),  
 Whakatū tārewa ki te Rangi, o haumi e, o hui e, o taiki e  
 (Suspended from the heavens: Prosperity, consolidation, united).

## **Introduction**

The world over, Indigenous peoples and their knowledge systems make substantial contributions to environmental sustainability. Informed by rich ontologies and cosmogonies that have survived throughout time, many Indigenous knowledge systems are deeply imbued with elaborate narratives about all manner of phenomena, including the capacity to sustain local natural environments in arguably non-exploitative and sustainable ways, often through utilising knowledges, practices, rituals and beliefs to ensure a natural equilibrium is maintained for generations to come. Consequently, there has been escalating interest over the past few decades for Indigenous knowledges to be applied to some of humanity's 'wicked problems,' such as climate change and environmental sustainability (Ayaa & Waswa, 2016; Buall et al., 2020; Johnson et al., 2021, 2022; McGregor, 2021; Tassell-Matamua, 2022).

This is indeed evident in Aotearoa|New Zealand. Within the past two decades, a re-establishment of gardening practices within some Indigenous Māori communities has occurred. Part of a more general impetus to acknowledge Indigenous perspectives by recognising the relevance of mātauranga (Māori knowledges) to everyday living for Māori,<sup>1</sup> and to revitalise practices and rituals associated with the whenua (land) and te taiao (natural environment) in particular, much of this reinstating has been based on understandings and narratives about historical practices known as māra kai, contemporaneously also referred to as

mahinga kai, or food gardens. Consequently, the development of māra kai initiatives throughout Aotearoa has occurred, with government agencies providing funding to assist with the establishment of such gardens (New Zealand Government, 2010). The revitalisation of māra kai is frequently situated within the framework of Indigenous food sovereignty (Hutchings, 2015; McKerchar et al., 2015). However, māra kai initiatives also provide an opportunity for a deep reconnection of Māori back to knowledge embedded within the whenua (land) and give full expression to the meaning inherent in the term most commonly used in reference to Māori, which is *tāngata whenua* – people of the land. Connecting back to the whenua also enables the re-establishment of relationships with te taiao more generally and the opportunity to recognise the intimate association between the wellbeing of te taiao and human wellbeing.

With a specific focus on the iwi of Tūhoe and one of its hapū (small kin-based grouping) situated in the Rūātoki valley in the Bay of Plenty in Aotearoa|New Zealand, we discuss how ancient Indigenous knowledge related to gardening has been ‘re-discovered’ and revitalised in the past several years. We first overview some of the recent history of the iwi as it relates to land. We describe the significance of māra kai and the associated māra tautāne ritualistic practice, and how it has been impacted over the past 200 years. We outline how the revitalisation of māra kai, but māra tautāne in particular, moves beyond simply being about food cultivation and has indirect and wider implications for knowledge regeneration, production and transmission, and the wellbeing of the land and local forest, while addressing broader social justice issues. Given the generic, albeit place-based, localised understandings that we explicate below, our work is meant as a starting point from which further exploration of māra kai, māra tautāne and the application of their associated knowledges can be undertaken by others, rather than an authoritative account.

### **Indigenous Māori: A Socio-Historical Overview**

To fully understand the importance of māra kai, māra tautāne, and the imperative of revitalising these practices and their associated knowledges, it is necessary to understand some of the socio-political-historical context of Aotearoa|New Zealand, particularly as it relates to whenua. Dominant narratives suggest the people from whom contemporary Māori descend arrived on the shores of Aotearoa, roughly 1000 years ago. Yet, localised narratives suggest Māori descend from the intermarriage between these early voyagers, who arrived not in one single migration but in many migratory journeys extending back *more* than 1000 years ago and spiritual entities that existed in Aotearoa since time immemorial. For example, the iwi Ngāi Tūhoe trace their ancestral connections back to Tūhoe Pōtiki and/or Pōtiki, who in turn are descended from the union between the mist, Hinepukohurangi, and the mountain, Te Maunga (Best, 2005; Tūhoe Deed of Settlement, 2013).

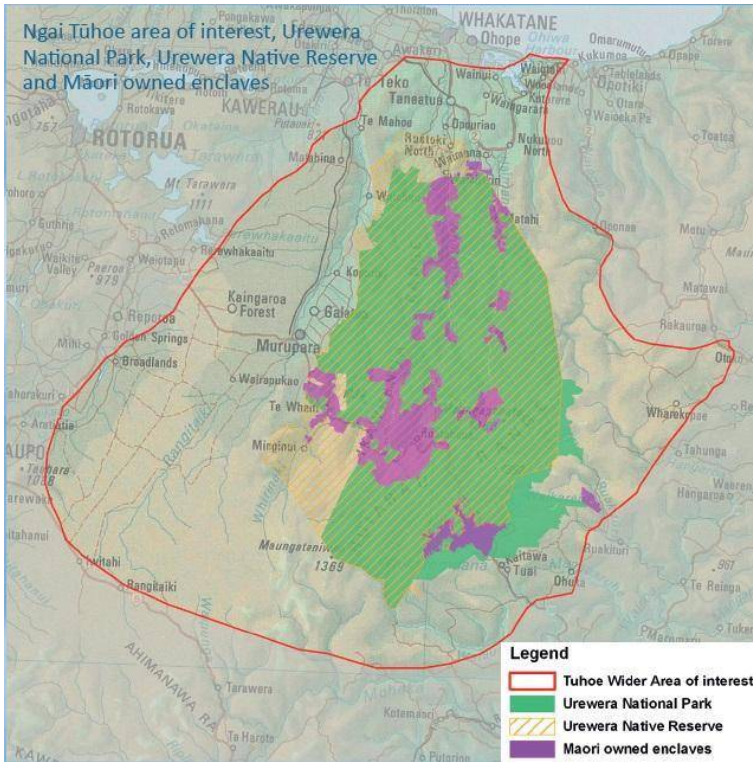
Prior to the arrival of European settlers, the Indigenous Māori inhabitants had established ways of living that were intimately connected with and complementary to the local environment. Communal living was according to immediate kinship ties categorised as *whānau*, *hapū* and *iwi* (Mead, 2016; Roberts, 2013),<sup>2</sup> and these groups were also geographically demarcated, such that kin-groupings would reside within specific locations, thus enabling a deep familiarity with the local landscape and ecology. Like other Indigenous peoples, this way of life had its foundations in rich cosmogonical narratives that speak to the origins of all life in the cosmos and the genealogical linking of all phenomena back to a spiritual source, known as *Te Kore* (the realm of potential being) (Tassell-Matamua et al., 2021), which is considered ‘the transcendent eternal world of the spirit’ (Marsden, cited in Royal, 2003, p. 62). From *Te Kore*, the celestial realm of *Te Pō* (the night) emerged, and it is from *Te Pō* that *Ranginui* and *Papatūānuku*, the sky father and earth mother, came into being (Royal, 1998). These primal *atua* begat *atua* of their own, who are specific types of spiritual energies believed to be manifestations of certain domains of existence. For example, sea life is manifest as the *atua* *Tangaroa*, while all things of the forest, including the birds and insects, are a reflection of the *atua* *Tāne* (Royal, 1998; Tate, 2012). It is through this line of descent that *Te Ao Mārama* (the realm of light) came into being, which is the dwelling place of material beings, including humans (Marsden, 1992; Reed, 1999; Royal, 1998).

These narratives provided the conceptual basis for understanding and interpreting reality (Durie, 1997; Williams & Henare, 2009) and are also the foundation for one of the most important ontological assumptions inherent to Māori, known as *whakapapa*. A complex concept, *whakapapa* is an organisational system that references epochs of time and taxonomies but is most commonly used to refer to genealogical connections among humans. However, *whakapapa* also denotes the genealogical links of all phenomena in the universe, including non-human, back through a common lineage to the creation of the universe and inherently acknowledges the intimate interconnectedness of all beings with each other (Durie, 2012; Harmsworth & Awatere, 2013; Harris & Tipene, 2006; Hikuroa, 2017; Tassell-Matamua et al., in press). Thus, *whakapapa* provided the ontological and epistemological foundations from which Māori historically engaged with the wider environment, recognising that it predated human existence and that humans are genealogically junior to all of nature. The ancestral connection of humans back through *Papatūānuku* and beyond meant great reverence was afforded to the land, who is the embodiment of the great earth mother and to her children, who collectively have and continue to give life to all beings on Earth. When conceptualised in this way, Māori understandings recognised that the land is a sacred creation of the ultimate spiritual source and that humans do not hold dominion over the land or nature, but rather are caretakers of it. Therefore, it was incumbent on humans to act in ways that recognise, enhance and maintain the sanctity of nature and ensure its wellbeing.

Up until roughly 200 years ago, all land in Aotearoa was customary Indigenous Māori land, lived on by Māori in accordance with these understandings; that of land being the embodiment of Papatūānuku and her children, and the role of humans as caretakers. Yet, since the early-1800s, there has been a dramatic and consistent depletion of customary land, perhaps instigated by Te Tiriti o Waitangi, the so-called ‘founding’ document of Aotearoa New Zealand that outlines the rights and responsibilities of Māori and non-Māori settlers. The signing of this document facilitated the mass migration of British settlers (Apiti et al., 2023) and subsequent impacts on Māori customary land, such that in contemporary times very little remains (Te Tumu Paeroa, 2023). Of the land that remains under Māori control, most of it is freehold land, which was created by the Land Courts in the early 19th century, often without consultation with the iwi and hapū who held customary tenure over the land, for the purpose of converting communal ownership to individual title (Te Tumu Paeroa, 2023). This enabled land parcels to be more readily acquired by early settlers, and, by the mid-1800s, European arrivals were purchasing customary land across Aotearoa in ways that mimicked the practices of their mother country and implied permanence of individual ownership and intergenerational entitlement of the owner’s descendants (Kennedy et al., 2022); a direct contrast to Māori ontological perspectives that denote humans as mere caretakers of the land rather than owners of it. Concomitantly, the Crown<sup>3</sup> was implementing mass confiscations of Māori land, known as raupatu, across the country (Boast & Hill, 2009). These acts combined resulted in the alienation of many Māori from their customary lands, severing the ties that bound them as caretakers of Papatūānuku and resulting in the erosion of practices, rituals, beliefs and values associated with such lands, a situation that has remained through to contemporary times.

Despite not being signatories to Te Tiriti o Waitangi, the iwi Ngāi Tūhoe were extensively affected by settler land acquisition approaches. Their customary lands cover an immense geographical area that encompasses the vast forested landscape known as *Te Urewera*, with the northern boundaries of the iwi lands beginning just inland from Whakatāne, extending east to Waiootahe, west to Kaingaroa and south to Waikaremoana (see figure 1).

**Figure 1**  
*Ngai Tūhoe customary land boundaries*



*Note.* Map showing Ngai Tūhoe customary land boundaries.  
 Copyright 2023 by Ngai Tūhoe iwi (ngaituhoe.iwi.nz).

This area was, however, known to be much broader prior to the Crown’s land acquisition tactics beginning in the mid-1800s. While notably retaining full control of their customary lands for a longer duration than most other iwi across the country, in 1865, much of the most productive land across the Tūhoe tribal area was unreasonably confiscated by the Crown for supposed transgressions by some iwi members. This confiscation was followed by a six-year period of extensive warring against Tūhoe, whereby the Crown employed genocidal tactics, including the so-called ‘scorched earth’ technique of burning crops, food stores and animals, as well as homes and ancestral sites of significance. The use of these tactics is even more abhorrent considering that nearly all Tūhoe settlements affected were not harbouring combatants. Tūhoe suffered immensely, with many of its people displaced and starved to death. Although peace was restored in 1871, the ensuing 50 years resulted in continued substantial land loss for Tūhoe, much of which was due to Crown pressures to sell land lest it be taken, unreasonable and enforced roading and survey costs on Tūhoe lands that led to the iwi surrendering many

parcels of land to pay for these costs, as well as the returning of confiscated Tūhoe lands to other iwi by the Compensation Court. By 1921, only 15% of what was then known as Urewera Reserve land remained in Tūhoe customary ownership. In 1954, Te Urewera National Park, which included most of Tūhoe's customary lands, was established by the Crown, but without consulting Tūhoe leadership or acknowledging the special significance the land, and indeed the forest (ngahere), held for Tūhoe. The establishment of the park restricted Tūhoe from utilising the land comprising the park and adjoining lands for customary purposes (Tūhoe Deed of Settlement, 2013).

This sustained period of unjustified confiscation and removal of Tūhoe from customary lands, combined with an intentional campaign of epistemicide through the scorched earth tactics and subjugation of cultural practices, as well as newly introduced policies, legislation, systems and diseases, resulted in social, economic, political and educational disadvantage, and caused a slow but steady distancing of Tūhoe from their customary lands, and a concomitant decline in the practices, beliefs, rituals, and their associated values that were inevitably tied to the ancestral whenua. Coupled with these losses were declines in information and knowledge production and exchange that would typically be expected from communal modes of living reliant on collective engagement in common activities and the intergenerational transfer of information as a form of succession planning. Declined social cohesion, loss of language and loss of spiritual and physical connection to geographical localities of importance were also collateral consequences. Research indicates Indigenous communities are adversely affected by environmental change, particularly that which is local and at places and spaces of particular significance to local communities (Middleton et al., 2020), and this indeed was the case with Tūhoe. The implications of these historical events were not static and have had an enduring effect on the wellbeing of the peoples of Tūhoe. In contemporary times many Tūhoe descendants (an estimated 85%) no longer live on their customary lands, and those that remain continue to live within the limits of the various restrictions placed on their ancestral lands and resources by the Crown (Tūhoe Deed of Settlement, 2013).

The past decade has provided an opportunity for rectification of historical transgressions enacted on the Tūhoe people by the Crown. Some Tūhoe customary land, most notably the land known as Te Urewera, was recently returned to Tūhoe as part of the Ngāi Tūhoe Deed of Settlement (2013), in which the New Zealand government acknowledged and apologised for the historical atrocities the people of Tūhoe were subjected to, including the confiscation of ancestral lands. This was assisted by the Te Urewera Act (2014), which accords the geographical area of Te Urewera legal personality and gives it the same legal rights, powers, duties and liabilities as an individual person, with humans appointed to guard and serve the best interests of Te Urewera. The return of Te Urewera to Tūhoe and the passing of this act accords somewhat with Māori ontology and recognises it in law, acknowledging Te Urewera as a living ancestor that must be cared for and

protected (Magallanes, 2015). Combined, these gestures of recompense have enabled Tūhoe to commence the process of relational reconciliation to this living entity and reconceptualise how its people can once again enact ways of living and understanding that are aligned with an ontology that recognises the potency of Papatūānuku and her children as the sources of material earthly life and endorses whakapapa and its main premise of the interconnection of all living beings. The re-establishment of māra kai and the associated ritual of māra tautāne are but one part of this process.

### **Māra Kai and Māra Tautāne: Traditional Gardening**

Māra kai were communal gardens that traditionally held much importance to Māori, particularly prior to the extensive settlement of early Europeans in the 1800s. Primarily used for food production, the practice of māra kai has been refined over time, ensuring the alignment of food cultivation with the seasons, as well as with localised environmental conditions. Although initially restricted to what was available within a given location at a particular time, upon European settlement, Māori across Aotearoa began trading with the new arrivals and gradually acquired new types of crops and technologies that diversified their māra kai practices to incorporate exotic plants (Best, 1925; Hargreaves, 1959, 1963). Māra kai were not only a necessary means of physical survival but also served secondary functions. The communal effort involved in the cultivation and maintenance of such gardens meant māra kai promoted and maintained social cohesion. Due to the reliance on place-based knowledge that was grounded in observances, interactions and engagement with the localised environment, māra kai also provided a vital means of intergenerational knowledge production and transmission that facilitated a form of succession planning. Importantly, the practice of māra kai also encouraged an experiential connection with Papatūānuku specifically and te taiao, the natural environment, more generally. Regarded for enhancing the wellbeing of the local ecosystem – as creating and maintaining māra required an intimate understanding of how the whenua connects to the wider environment – māra kai reminded Māori of their place within the wider cosmos.

Consequently, the process of establishing māra kai was considered deeply sacred and often involved ritual prior to, during and after the māra were established. Of those rituals, among the most pertinent was the annual formation of māra tautāne, small gardens situated outside the larger cultivation areas, set up in recognition of atua Māori and serving the purpose of drawing on those spiritual energies to promote growth and wellbeing of the harvest over the coming season. The ritual itself often involved the ceremonial act of each whānau member or representative, planting seed tubers in the small, cordoned area of the māra tautāne in the presence of a tōhunga,<sup>4</sup> who recited karakia (incantations) during this process. A feast formed a part of this ceremony, and the timing of the ritual was typically aligned with the annual heliacal appearance of specific celestial bodies, which were utilised as environmental signs that certain processes (i.e., planting,



harvesting, etc.) needed to commence. Subsequent produce grown within te māra tautāne was offered to various atua, according to Māori cosmogonical beliefs. For example, *Rongo*, the Māori atua of cultivation, would be acknowledged through incantations and ceremonially offered some produce, while other atua who represent specific stars in the constellation of Matariki (Pleiades), would also be acknowledged and honoured through ceremonial offerings. A kūmara (sweet potato), for example, might be offered to the star Tupuānuku, and a kererū or another bird from the forest offered to the star Tupuārangi. Likewise, an eel or freshwater fish would represent the star Waitī, and some form of shellfish or sea life would be chosen for the star Waitā. Only the best foods would be presented.

Much of what is known about pre-European māra tautāne practices, as well as those practices that survived beyond the early period of European settlement, comes from the writings of explorers and anthropologists, who documented rituals, beliefs and practices of Māori in specific localities across Aotearoa, through observation or obtaining oral information. This information remains subject to the etic lens of the writer, who may not have completely understood all the nuance informing such practices, beliefs and rituals, nor necessarily endorsed the same ontological perspective that Māori did. Yet, historical writings provide vital insight into the ritual of māra tautāne by Māori. At the time of renowned anthropologist Elsdon Best's observations of Māori cultivation practices, he described māra tautāne as an 'old, old ceremony,' but one that was most notably still followed by some hapū of Ngai Tūhoe (Best, 1925). However, the ongoing dispossession of Tūhoe from their customary lands severely disrupted these practices. Without the land and communal connections that once existed for Tūhoe, the establishment of māra kai declined rapidly and, along with it, the ritual and ceremony of māra tautāne.

### **Revitalising Traditional Practices: Māra Kai and Māra Tautāne in Contemporary Times**

Within the past two decades, a re-establishment of gardening practices within some Māori communities has occurred, and within Tūhoe hapū in particular. Of note, the hapū Te Māhurehure situated in the Rūātoki valley, an area immediately adjacent to Te Urewera, have re-established māra kai practices, and, in 2021, the hapū also erected the first māra tautāne in the Rūātoki valley for over 200 years,<sup>5</sup> thus revitalising this ancient ritual. The māra tautāne site itself consists of five *pou* (carved pillars) that represent a whakapapa of the kūmara, a prominently harvested food source in the valley, back to ngā whetū o te rangi (the stars).

**Figure 2**  
*Te māra tautāne*



*Note.* Photo of Te māra tautāne in the Rūātoki Valley. Copyright 2023 by Centre for Indigenous Psychologies.

As shown in figure 2, the large pou in the middle of the site represents the celestial body known as *Whānui* (the star Vega). The pou to the left of Whānui represents the celestial body known as *Pani Tīnaku*, who was the wife of Rongo Māui. The pou at the front left represents the atua *Haumīetikitike*, an offspring of Ranginui and Papatūānuku, and manifestation of uncultivated foods. The pou on the right side next to Whānui represents the celestial body known as *Rongo Māui*, who was the younger brother of Whānui. The pou to the front right represents the atua *Rongomātāne*, a further offspring of the primal parents, Ranginui and Papatūānuku, and the manifestation of both cultivated food and peace. These pou represent a specific narrative that denotes how the kūmara, came to be grown by the people of Tūhoe. According to one account, Whānui held the seed of the kūmara. Whānui's brother, Rongo Māui stole the seed from his brother as a means of comforting his wife, Pani Tīnaku, who was unable to bear children. Returning with the seed, he gave it to Pani Tīnaku, who gestated it and eventually birthed the kūmara into existence, thus providing Tūhoe people with the means of growing this plant to sustain themselves. As revenge for the transgression against him, Whānui sent three moths, the anuhe, toronū and moko, to ravage the kūmara leaves.

Although part of a more general movement to globally recognise the importance of Indigenous knowledges and a movement locally to acknowledge mātauranga (Māori knowledge) as an integral part of the socio-cultural milieu of Aotearoa, the establishment of māra kai and the associated māra tautāne in the Rūātoki valley, have particular relevance for Tūhoe as a people. Providing but one way to implement and practice the principles laid out in *Te Kawa o Te Urewera*,<sup>6</sup> they highlight that beyond food provision, māra hold deep cultural and spiritual significance to Tūhoe as a people. Research suggests that Māori identity is associated with an enhanced sense of environmental connection (Apiti et al., 2022; Tassell-Matamua et al., 2021) and implementing māra practices on customary land enhances one's cultural identity, which in turn is likely to enhance a sense of connection with the environment (and indeed, vice versa). But the establishment of māra kai and māra tautāne also facilitates the revitalisation of not just the gardening practices and their rituals but a range of related knowledges.

For example, the specific pou of the māra tautāne and their accompanying narrative serve several socially epistemic functions. They facilitate a process of language revival related to specific aspects of the cosmos. By reciting the narrative related to what each pou represents and how they are linked to each other, the terminology associated with the māra tautāne is more frequently used, thus elevating such terms back into the everyday conversations of the Rūātoki valley community, who are predominantly *te reo* (Māori language) speaking. However, like concentric circles on a pond, the revitalisation of such terms in this specific community will reverberate out into other communities, as people connect with each other and share the narrative of the māra tautāne. Additionally, they are an ethical reminder about the outcomes of one's action, thus implying a moral code to guide behaviour and explain the effects of one's actions. For example, stealing the kūmara seed had both beneficial and non-beneficial consequences, such that Pani Tinaku was able to satisfy her desire for offspring, the kūmara was able to be cultivated to sustain communities, but the moth is a blight on the kūmara as a reminder of the original transgression of stealing the seed.

The pou and narratives of the māra tautāne also serve the function of the revitalisation of ecological knowledge. Firstly, they are a symbolic reminder of the interconnection between the lifecycles of phenomena in the wider cosmos (e.g., the moth only ravages the kūmara leaves during particular parts of its lifecycle) and the seasonal cycles that dictate the growth of the kūmara. But, they also provide an example and denote an awareness and understanding by Tūhoe of the risks of biosecurity incursions (i.e., the moth) and the influences they can have on the quality of food cultivation. Additionally, part of the process of tending to the māra kai requires the brewing of specific tonics using the leaves of certain plant species (e.g., *kawakawa*<sup>7</sup>) that are applied as fertilisers on the māra. To acquire such plants, hapū members must, by necessity, enter the ngahere and interact with that environment. Because the ngahere serves as a vital source of nutrients for the māra kai, then those who interact with the ngahere for this purpose must, by necessity,

understand the wellbeing of the plants that are used for the tonics. Such a process promotes a greater cognisance of the wellbeing of other plants that grow in proximity to the required plants, and this will also likely have a flow-on effect on other species. With a greater understanding of the wellbeing of the ngahere comes a greater ability to observe when the ngahere is not thriving and if biosecurity incursions, such as the myrtle rust pathogen that is currently ravaging many parts of Aotearoa, including forested areas near Te Urewera (Toomes-Heller, 2020), might be implicated in that. In this sense, māra kai and māra tautāne become, through their associated activities, practices that facilitate deeper understanding of the wellbeing of the ngahere and the various relationships between plant and animal species and facilitate people becoming the unofficial biosecurity ‘officers’ of the ngahere.

Interacting with the natural environment has known beneficial effects on mental, physical and social wellbeing (Darcy et al., 2022; Keniger et al., 2013; Pretty et al., 2005; Souter-Brown, 2014; Tillman et al., 2018), and community gardening, in particular, is associated with higher levels of subjective wellbeing and higher levels of resilience and optimism (Joyce & Warren, 2016; Koay & Dillon, 2020; Ohly et al., 2016; Spano et al., 2020). Therefore, a concomitant effect of the revitalisation of māra kai and māra tautāne is the individualised benefits this can have for community members. As with all Māori, the hapū in Rūātoki continue to suffer the ongoing effects of systematic and systemic colonisation and are recovering from the disenfranchisement from their customary lands (Te Uru Taumatua, 2023). Gardening practices provide a natural means for catalysing a broad range of wellbeing outcomes, including the facilitation of social cohesion, which in turn is related to wellbeing (Delhey & Dragolov, 2016; Sempik et al., 2005). The annual ritual of the māra tautāne provides an opportunity for the same effects, as it involves a communal gathering and participation in planting, reciting incantations and feasting with other members of the community. Māra kai also provide an economically viable means of sustaining the community, as cultivating gardens ensures there is a ready supply of fresh vegetables for the community, even in the absence of financial capability to purchase such food from external suppliers (i.e., supermarkets). In that sense, the revitalisation of knowledge about and the practice of māra kai and māra tautāne serve as tools of psychological, social and financial emancipation for the people of Te Mahurehure.

## **Conclusion**

While the knowledge systems of Indigenous peoples can offer unique theoretical insights that can lead to new ways of addressing particular issues, such as global climate change, they also have much validity for addressing more localised issues that are experienced by Indigenous peoples themselves. Yet, such knowledges cannot be divorced from the ontologies that inform them, nor should they be de-contextualised from the contemporary socio-political environments of systemic and systematic colonisation that many Indigenous peoples find themselves in. As has

been discussed, Indigenous knowledge in the form of gardening practices and rituals has many beneficial implications for the people of Tūhoe. While the revitalisation of this knowledge is still in its infancy, it holds much promise for effecting social, physical, psychological, financial and spiritual change for communities in the Rūātoki valley. For Te Māhurehure, in particular, māra kai and māra tautāne represent a connection to ancestors, ancestral lands and ancestral practices. They represent a connection to future aspirations and to future generations. They represent and acknowledge an ongoing connection as tāngata whenua to the wider ecosystem.



Marie McEntee, <https://orcid.org/0000-0001-7228-2930>

Natasha Tassell-Matamua, <https://orcid.org/0000-0002-1644-3821>

### **Acknowledgements**

The authors would like to acknowledge and thank Ruth Nesi Bryce, Huka Williams and Leela Uatuku for their support and guidance throughout the documenting of the māra tautāne re-establishment, as well as their conceptual contributions to this manuscript. We offer gratitude also to Ngarangi Chapman and Aporina Chapman for their contributions. Finally, we offer appreciation also to Neihana Matamua who reviewed the manuscript and provided commentary on the history of Ngai Tūhoe.

### **Funding**

This work is funded by the Ministry of Business, Innovation and Employment (Mobilising for Action theme of the Ngā Rākau Taketake programme of the Biological Heritage National Science Challenge in Aotearoa/New Zealand C09X1817).

### **Author contributions**

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

### **Conflict of interest statement**

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

### **Notes**

1. Throughout the article, the term Māori is used to refer to people who have ancestral connections to the Indigenous communities that inhabited Aotearoa prior to the arrival of European settlers. We acknowledge contemporary Māori are not homogenous and use the term to encapsulate a collective of peoples who are ancestrally Indigenous to Aotearoa.

2. The term *iwi* is often translated as ‘tribe’ but might more appropriately be considered as a larger community of people comprised of several groupings of hapū. Hapū is often translated as ‘sub-tribe,’ but more appropriately means a group that is smaller than an iwi and comprised of several whānau. The term whanau is often translated as family or families

and can be both kin and non-kin based. Some iwi prefer to identify themselves as nations (Kruger, 2017).

3. The Crown is a term historically used to describe representatives of Her Majesty. Contemporaneously, it is used to refer to the establishment that is the New Zealand Government.

4. Tohunga refers to a 'chosen or appointed one,' but can also take the meaning of 'expert' (Tassell-Matamua et al., in press, p. 9).

5. A short documentary of the opening of the māra tautāne is available at the accompanying storymap to this article titled *Te Māra Tuatāne* by Tassell-Matamua and Kora (2023).

6. *Te Kawa o te Urewera* (2023) is an official document published by Te Uru Taumatua, the tribal authority for Tūhoe, that describes the strategic vision for the management of people as they engage with Te Urewera, and describes aspirational principles by which this engagement should occur.

7. Kawakawa is the Māori name for the plant species known as *Piper excelsum*.

## References

- Apiti, A., Tassell-Matamua, N., Lindsay, N., Dell, K., Pomare, P., Erueti, B., Masters-Awatere, B., & Te Rangi, M. (2022). Indigenous Māori of Aotearoa (New Zealand): Environmental identity, rather than Māori identity per se, has greatest influence on environmental distress. *Ecopsychology*. Advanced online publication. <https://doi.org/10.1089/eco.2022.0053>
- Ayaa, D. D., & Waswa, F. (2016). Role of indigenous knowledge systems in the conservation of the bio-physical environment among the Teso community in Busia County-Kenya. *African Journal of Environmental Science & Technology*, 10(12), 467–475. <https://doi.org/10.5897/AJEST2016.2182>
- Best, E. (1925). *Māori agriculture: The cultivated food plants of the natives of New Zealand, with some account of native methods of agriculture, its ritual and origin myths*. Whitcombe & Tombs.
- Best, E. (2005). *Tuhoe. The children of the mist* (vol. 2; 3rd ed.). Reed.
- Boast, R. & Hill, R. S. (2009). *Raupatu: The confiscation of Māori land*. Te Herenga Waka University Press.
- Buell, M. C., Ritchie, D., Ryan, K., & Metcalfe, C. D. (2020). Using Indigenous and western knowledge systems for environmental risk assessment. *Ecological Applications*, 30(7), e02146. <https://doi.org/10.1002/eap.2146>
- Darcy, P. M., Taylor, J., Mackay, L., Ellis, N. J., & Gidlow, C. J. (2022). Understanding the role of nature engagement in supporting health and wellbeing during COVID-19. *International Journal of Environmental Research and Public Health*, 19(7), 3908. <https://doi.org/10.3390/ijerph16081352>
- Delhey, J., & Dragolov, G. (2016). Happier together: Social cohesion and subjective wellbeing in Europe. *International Journal of Psychology*, 51(3), 163–176. <https://doi.org/10.1002/ijop.12149>
- Durie, A. (1997). Te aka matua: Keeping a Māori identity. In P. Te Whaiti, M. McCarthy, & A. Durie (Eds.), *Mai i rangiātea: Māori wellbeing and development* (pp. 142–162). Auckland University Press.

- Durie, E. (2012). Ancestral laws of Māori: Continuities of land, people and history. In D. Keenan (Ed.), *Huia histories of Māori: Ngā tāhuhu kōrero* (pp. 2–11). Huia.
- Hargreaves, R. P. (1959). The Māori agriculture of the Auckland province in the mid-nineteenth century. *The Journal of the Polynesian Society*, 68(2), 61–79.
- Hargreaves, R. P. (1963). Changing Māori agriculture in pre-Waitangi New Zealand. *Journal of the Polynesian Society*, 72(2), 101–117.
- Harmsworth, G. R., & Awatere, S. (2013). Indigenous Māori knowledge and perspectives of ecosystems. In *Ecosystem services in New Zealand: Conditions and trends* (pp. 274–286). Manaaki Whenua Press.
- Harris, G. F., & Tipene, P. (2006). Māori land development. In M. Mulholland (Ed.), *State of the Māori nation: Twenty-first century issues in Aotearoa* (pp. 67–79). Reed.
- Hikuroa, D. (2017). Mātauranga Māori: The ūkaipō of knowledge in New Zealand. *Journal of the Royal Society of New Zealand*, 47(1), 5–10. <https://doi.org/10.1080/03036758.2016.1252407>
- Hutchings, J. (2015). *Te mahi māra hua parakore: A Māori food sovereignty handbook*. Te Wānanga o Raukawa. Wheelers.
- Johnson, D. E., Parsons, M., & Fisher, K. (2021). Engaging Indigenous perspectives on health, wellbeing and climate change: A new research agenda for holistic climate action in Aotearoa and beyond. *Local Environment*, 26(4), 477–503. <https://doi.org/10.1080/13549839.2021.1901266>
- Johnson, D. E., Parsons, M., & Fisher, K. (2022). Indigenous climate change adaptation: New directions for emerging scholarship. *Environment and Planning E Nature and Space*, 5(3), 1541–1578. <https://doi.org/10.1177/25148486211022450>
- Joyce, J., & Warren, A. (2016). A case study exploring the influence of a gardening therapy group on wellbeing. *Occupational Therapy in Mental Health*, 32(2), 203–215. <https://doi.org/10.1080/0164212X.2015.1111184>
- Keniger, L. E., Gaston, K. J., Irvine, K. N., & Fuller, R. A. (2013). What are the benefits of interacting with nature? *International Journal of Environmental Research and Public Health*, 10(3), 913–935. <https://doi.org/10.3390/ijerph10030913>
- Kennedy, B. J., Tassell-Matamua, N. A., & Stiles-Smith, B. (2022). Psychology in Aotearoa New Zealand. In G. J. Rich & N. A. Ramkumar (Eds.), *Psychology in Oceania and the Caribbean* (pp. 115–132). Springer.
- Koay, W. I., & Dillon, D. (2020). Community gardening: Stress, wellbeing and resilience potentials. *International Journal of Environmental Research and Public Health*, 17(18), 1541–1578. <https://doi.org/10.1177/25148486211022450>
- Kruger, T. (2017). *We are not who we should be as Tūhoe people*. <https://e-tangata.co.nz/identity/tamati-kruger-we-are-not-who-we-should-be-as-tuhoe-people/>
- Magallanes, C. J. I. (2015). *Nature as an ancestor: Two examples of legal personality for nature in New Zealand*. Victoria University of Wellington Legal Research Paper, 54. <https://doi.org/10.4000/vertigo.16199>
- Marsden, M. (1992). *Te ao hurihuri: Aspects of māoritanga*. Reed.
- McGregor, D. (2021). Indigenous knowledge systems in environmental governance in Canada. *KULA*, 5(1), 1–10. <https://doi.org/10.18357/kula.148>
- McKerchar, C., Bowers, S., Heta, C., Signal, L., & Matoe, L. (2015). Enhancing Māori food security using traditional kai. *Global Health Promotion*, 22(3), 15–24. <https://doi.org/10.1177/1757975914543573>.
- Mead, H. M. (2016). *Tikanga Māori: Living by Māori values* (rev. ed.). Huia.

- Middleton, J., Cunsolo, A., Jones-Bitton, A., Wright, C. J., & Harper, S. L. (2020). Indigenous mental health in a changing climate: A systematic scoping review of the global literature. *Environmental Research Letter*, *15*(5), 1–16. <https://doi.org/10.1016/j.socscimed.2020.113137>
- New Zealand Government. (2010). *One million dollar fund for mara kai*. <https://www.beehive.govt.nz/release/one-million-dollar-fund-m%C4%81ra-kai>
- Ohly, H., Gentry, S., Wigglesworth, R., Bethel, A., Lovell, R., & Garside, R. (2016). A systematic review of the health and wellbeing impacts of school gardening: Synthesis of quantitative and qualitative evidence. *BMC Public Health*, *16*, 286. <https://doi.org/10.1186/s12889-016-2941-0>
- Pretty, J., Peacock, J., Sellens, M., & Griffin, M. (2005). The mental and physical health outcomes of green exercise. *International Journal of Environmental Health Research*, *15*(5), 319–337. <https://doi.org/10.1080/09603120500155963>
- Reed, A. W. (1999). *Māori myths and legendary tales*. New Holland Publishers.
- Roberts, M. (2013). Ways of seeing: Whakapapa. *SITES: New Series*, *10*(1), 93–120. <https://doi.org/10.11157/sites-vol10iss1id236>
- Royal, T. A. C. (1998). Te ao mārama: A research paradigm. *He Pukenga Kōrero: A Journal of Māori Studies Koanga*, *4*(1), 1–8.
- Royal, T. A. C. (2003). *The woven universe: Selected writings of Rev. Māori Marsden*. Estate of Rev. Māori Marsden.
- Sempik, J., Aldridge, J., & Becker, S. (2005). *Health, wellbeing and social inclusion: Therapeutic horticulture in the UK*. Policy.
- Souter-Brown, G. (2014). *Landscape and urban design for health and wellbeing: Using healing, sensory and therapeutic gardens*. Routledge.
- Spano, G., D'Este, M., Giannico, V., Carrus, G., Elia, M., Laforteza, R., & Sanesi, G. (2020). Are community gardening and horticultural interventions beneficial for psychosocial wellbeing? A meta-analysis. *International Journal of Environmental Research and Public Health*, *17*(10), 3584. <https://doi.org/10.4324/9781315762944>
- Tassell-Matamua, N. A., & Kora, A. (2022). *Te māra tuatāne* [Storymap]. <https://storymaps.arcgis.com/stories/6e57872720bd4e98b604c2c9d1c10059>
- Tassell-Matamua, N. A., Lindsay, N., Bennett, A., & Masters-Awatere, B. (2021). Māori cultural identity linked to greater regard for nature: Attitudes and (less so) behaviour. *Ecopsychology*, *13*(1), 9–18. <https://doi.org/10.1089/eco.2020.0027>
- Tassell-Matamua, N. A. (2022, September). *Essential aspects of the relationship between psychology and Māori as we implement climate action in Aotearoa New Zealand* [Conference presentation]. NZ Psychological Society Annual Conference, Auckland.
- Tassell-Matamua, N., MacDonald-Nepe Apatu, K., Moriarty, T. R. & Tahuri, T. (In press). Indigenous Māori notions of consciousness, soul and spirit. *Journal of Consciousness Studies*.
- Tate, Pā H. (2012) *He puna iti i te ao mārama*. Libro International.
- Te Tumu Paeroa. (2023). *What is whenua Māori?* <https://www.tetumupaeroa.co.nz/about-the-whenua/what-is-whenua-maori/>
- Te Urewera Act. (2014).
- Te Uru Taumatua. (2023). *Te kawa o te Urewera*. <https://www.ngaituhoe.iwi.nz/te-kawa-o-te-urewera>
- Tillmann, S., Tobin, D., Avison, W., & Gilliland, J. (2018). Mental health benefits of interactions with nature in children and teenagers: A systematic review. *Journal of*



*Epidemiological Community Health*, 72(10), 958–966. <https://doi.org/10.1136/jech-2018-210436>

Toome-Heller, M., Ho, W. W. H., & Ganley, R. J. (2020). Chasing myrtle rust in New Zealand: Host range and distribution over the first year after invasion. *Australasian Plant Pathology*, 49, 221–230. <https://doi.org/10.1007/s13313-020-00694-9>

Tūhoe Deed of Settlement. (2013). *Deed of settlement of historical claims*. <https://www.govt.nz/assets/Documents/OTS/Ngai-Tuhoe/Ngai-Tuhoe-Deed-of-Settlement-4-Jun-2013.pdf>

Williams, L. R. T., & Henare, M. (2009). The double spiral and ways of knowing. *MAI Review*, 3. <https://www.review.mai.ac.nz/mrindex/MR/article/view/220/295.html>