# Harnessing Körero Tuku Iho for Flourishing Land Management at Awhi Farms

# TAIG RONGG

How do we build capacity and capability to preserve and reignite Māori ancestral knowledge systems and practices for understanding our natural world in our Māori agribusiness landscapes; and

How do we transform the way we do Māori agribusiness in a way that puts our ancestral knowledge systems at the heart of the way we interact and work with te taiao, including our land use and land management decisions?

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# KUPU WHAKATAKI: Acknowledgement

E tū e te wānanga. E rere e te kupu, inā Ngā tuhi o te rangi Ngā tohu o te papa Mā te tirotiro mā te whakarongo e E kite ai te marama E hua ai te mārama I ngā Tai-o-Rongo e<sup>1</sup>

E rere ana te au o mihi ki te nuku, ki te rangi, ki ngā tūpuna, ki a tātau te kaupapa tangata, otirā ki a Tai-o-Rongo me hōna hua.

Tēnei te kōrero ka tau, hei wānangatanga mā te iti, mā te rahi.

We acknowledge the wisdom of our tūpuna (ancestors) of our tuakana (elder siblings) gifted in the whakapapa (genealogical) descent of our kõrero tuku iho. All of which has continued to maintain regardless of the pervasive influence of colonialism on our thinking, habits, and practices and all while we continue to operate within a colonised society and educational system (Mahuika, 2011; Moewaka Barnes & McCreanor, 2019). We recognise the transformative potential of embracing our response-abilities to our lands and ecosystems, fostering rich, diverse, and empowered relationships with our surroundings(Riechers et al., 2021). This engagement is not passive observation but active participation, characterised by a commitment to effecting positive change(Berkes et al., 2000; Burgos-Ayala et al., 2020).

This is a reminder that to be mokopuna driven we must continue to truly understand our connection to the land, we must pay deep attention to the subtle cues and common worlds that exist within our natural environments. This entails actively engaging with the rivers, waters, and ecosystems that surround us, listening, learning, and responding to their needs. It is a political stance, a call to action, urging

<sup>&</sup>lt;sup>1</sup> Waiata from Tai-o-Rongo.

us to voice our concerns and advocate for the well-being of our shared animate heart (D. N. T. King, 2008; Skipper, 2020).

Tai-o-Rongo is a rejection of the notion of revolutionary change in favour of solution-ary action, grounded in aspirational language and a commitment to collaborative problem-solving(Seddon et al., 2021). Our goal is not to overthrow existing systems but to work within them, leveraging our collective strengths and capacities to create positive outcomes for our communities and environments.

Embracing korero tuku iho and recognising our interconnectedness with the natural world, we position ourselves as active stewards of our lands and ecosystems. This is not just a theoretical concept but a practical philosophy that informs our everyday actions and decisions, driving us towards a more sustainable and harmonious relationship with the world around us.

# TAIG RONGG

he tuhi, he tohu, he tirotiro tuku iho, tuku iho ki te tangata tupu ake, tupu ake i te whenua

> transmission of knowledge through reconnecting to place and the revival of ceremony

## **KUPU WHAKATAKI: Introduction**

Over millennia our tūpuna (ancestors) have been migrating across Te Moananui-a-Kiwa from Hawaiki (ancestral homeland of Māori- the indigenous people of Aotearoa New Zealand) bringing with them an intimate understanding of taiao (the natural environment) including climate, seasons, stars and weather which ensured successful voyages throughout Te Moananui-a-Kiwa (Tuaupiki, 2022). These highly skilled whānau were "...some of the best marine scientists, astronomers, meteorologists, and boat building engineers to plan these voyages and build these vessels" (Tuaupiki, 2022) (np). This extensive localised knowledge system of environmental indicators from Te Moananui-a-Kiwa was expertly recalibrated to the local conditions in Aotearoa where Tūpuna faced a much colder and harsher climate. Adapting to Aotearoa- an archipelago in the heart of the world's largest ocean, required an understanding of the movements of nature which is reflected in our Tupuna legacy left to us, the descendants of these great scientists. Their legacy exists in the forms of pūrākau (traditional narratives), karakia/tātai (prayers and incantations), waiata (songs), haka (dance) whakatauki/whakatauāki (proverbial expressions), kī peha (figurative expressions) and taonga toi (paintings, panels and carvings) (Mead & Grove, 2004), tikanga (lore, custom, correct procedure), tauparapara (incantation at the beginning of a speech) and ngā korero a kui ma, a koroua ma (the words of our elders) (Hoskins et al., 2008). Both tacit and codified knowledge are composed in Korero Tuku Iho, as are a suite of dynamic techniques for investigating natural phenomena and updating, integrating and adapting it (Hikuroa, 2017).

This knowledge, collated over many hundreds of years of careful observation and experimentation to ensure its accuracy was incorporated by Māori into cultural practices and all activities including mahi hī ika (fishing), ahuwhenua (agriculture) kohi rongoā (gathering medicine) and kaitiakitanga (conservation practice) (Skipper, 2020). Whānau (family members) added to the collective lwi knowledge shared amongst the hapū by contributing their own observations which were an essential everyday practice. Through these expressions a strong sense of connectedness to place was amplified by an oral memory culture which wove Māori into the landscapes they inhabited through stories (Smith, 2020). Bound to place, this deep

environmental knowledge was critical to human survival in Aotearoa (Smith et al., 2016).

"Māori have developed a detailed knowledge of local environmental features and processes. This environmental knowledge has been transmitted orally by successive generations as an integral part of a wider holistic understanding of the natural and spiritual world."(King et al., 2007) (p.60).

Māori creation narratives derived from careful whānau observation and deep contemplation of the natural world's biological rhythms (Walker, 1990). Ancestral stories outlined maps were codified information on how to take care of the world we lived in. To ensure that this knowledge was disseminated and embedded within their iwi and hapū, tohunga (tribal knowledge holders) established whare wānanga (learning institutions) to develop the next generation of specialist knowledge holders (Jones & Biggs, 1995). Here, students were trained to be observant through sound, taste, touch, smell and puku (intuition) to be acutely aware and notice any warning, sign or tohu and learn the proper response to it (Skipper, 2020). Through their lived experience, students of the whare wānanga relied on their experience, understanding and intuition and were able to make clear sense of physical and spiritual observations. Tai-o-Rongo is the latest in a line of wānanga established to ensure the continuity and contextual application of ancestral knowledge within a vastly different land to the volcanic islands our navigational whānau sailed from some 800 years ago.

# MĀORI AGRIBUSINESS: Ātihau - Awhi Farms

Toitū te whenua, Toitū te tangata, Toitū te mana Our purpose, Our legacy, is to look after nature, so nature can look after us

Ātihau-Whanganui Incorporation (Ātihau) is a Māori sheep and beef farm incorporation based from the foothills of Ruapehu to the Whanganui river. Ātihau has adopted the name Awhi as its brand. Awhi is an acronym, the 'A' is Ātihau, the 'wh' is Whanganui and 'i' is Incorporation which also aligns with the Māori word, 'awhi'.

"Awhi' means to embrace, support and nurture, which sums up the way we see our place in the world. The land nourishes us, and we treat the land and everything on it with care and respect. That is because when nature flourishes, we all flourish. We believe in a natural kinship between people and the natural environment, an inseparability of our mutual well-being. In an era where large-scale farming extracts as much as possible out of nature, we walk a different path. We actively renew our natural environment as we craft simply the purest products to share with our customers around the world. We believe that all life is connected – people, land, trees, animals, birds, insects – we are all in this world together. Committed to the concept of morimori or care, we work to restore our natural environment as it nurtures us in return. It is something we do for the good of our tamariki and mokopuna, our future generations." Extracted from https://www.atihau.com/our-business#Overview (Incorporation, 2020)

The next strategic development for Ātihau is to include whānau, hapū and lwi through Tai-o-Rongo, in the development of utilising kōrero tuku iho, Māori ancestral knowledge systems and practises to support the capacity and capability building within the lwi (whom make up 30% of employees within the incorporation) and to assist the agribusiness to better understand our natural environment as part of the morimori, restoration of the natural environment. One of the questions this literature review asks is how the subtle signals in nature might reveal strategies for the Māori agricultural industry and how it can support the sustainable development of agribusiness and also, regenerate the natural environment and all those who source their wellbeing from it? Tai-o-Rongo has been established to develop research to

understand how the use of these ancestral knowledge systems can transform the way Ātihau interact with the taiao and inform land use and land management decisions.

#### What is Tai-o-Rongo?

Tai-o-Rongo is a wānanga based at the foot of Ruapehu. The name Tai-o-Rongo comes from the idea of ngā tai o te nuku, ngā tai o te rangi e areare ai ngā rongo ā-tangata – the elements of the heavens and earth that help humanity to observe intently. It is a wānanga that focuses on:

- 1. Observing the environment at monthly, seasonal and annual periods with accompanying predictions.
- 2. Revival of seasonal ceremonies; and
- 3. Applying these knowledge sets to Māori farm practices and iwi environmental monitoring.

# NGĀ TOHU KI TAI-O-RONGO

Tai-o-Rongo was established by Che Wilson. He is known as the pouwhenua of the wānanga, a title that holds the mouri<sup>2</sup> of the wānanga, akin to a taimua (leader of a wānanga or ritenga). He was fortuntate to be trained in the Whanganui iwi whare wānanga in the arts of whakapapa, mau rākau, whaikōrero, karakia and waiata tawhito.

The pouwhenua was raised in Ohakune at his maternal marae, Maungārongo. Maungārongo is the headquarters of the māramatanga (spiritual movement) of his great-grandfather, Te Mareikura Hori Enoka. Te Māreikura was taught with Tahupōtiki Wiremu Rātana by the famous prophetess, Mererikiriki from 1910 to her death in 1926.

The pouwhenua had access to a number of tohunga, both ruānuku and ruahine including: Matiu Mareikura, Hoana Akapita, Te Uta Murphy-Peehi and Rangitihi Tahuparae, and kaumātua like Te Peehi Waretini and Raana Mareikura. He was reared to be a knowledge holder and has progressed to being a tribal leader. He is also recognised nationally and internationally as a cultural ambassador.

In 2015, while living and working in Christchurch, the pouwhenua was interviewed by Dr Rangi Matamua about stars and seasonal cycles. Through the course of this interview, the pouwhenua realised that the seasonal knowledge he was taught from his parents and particularly his father was quite signifcant. He had underplayed this knowledge because his parents weren't native speakers of te reo. However, through this interview, he realised his mentors from the whare wānanga also feed him kōrero tuku iho to compliment how his parents had raised him, specifically knowledge associated to gardening, the forest and flora identification and reading weather patterns.

# **Establishment of Tai-o-Rongo**

The pouwhenua attended a poipoi wānanga (a wānanga to learn whakapapa to the beat of a poi) called by the Taimua (lead tohunga) of the iwi whare wānanga at Te Ao

<sup>&</sup>lt;sup>2</sup> Mouri is more commonly spelt mauri elsewhere around the country.

Hou in February 2021. At the wānanga, the pouwhenua informed the wānanga of his intention to revive a modern iteration of the various whare wānanga that once stood within our iwi. As pouwhenua, he was clear that his role was to inform the whare wānanga and the tūpuna in the ao wairua realm that are present when the taimua opens these particular wānanga.

The following month, Tai-o-Rongo was formally invoked through karakia on the moon phase of Whiro, Poutūterangi 2021. A small group of Ngāti Rangi staff and uri with a random Rarotongan visitor, camped at Te Rangiwānangananga at the top of the Karioi Forest. This site was a traditional whare wānanga for Ngāti Rangi to study the stars.

The composition of Tai-o-Rongo was also important. The pouwhenua was mindful that the other wānanga he had been involved in often drew like minded people to those gatherings. He felt it was important to have a small, diverse group that had expertise that included: language and culture, hunter-gatherers, gardeners, artists, navigation, and people that had more knowledge than the pouwhenua in certain fields including Māori astronomy, lunar phases and navigation. He was also mindful that the one group within te ao Māori that hadn't had a broken link in its intergenerational transmission of knowledge were those in the hunter-gatherer and gardening groupings. This group has often been downplayed as many of them see that knowledge the unbroken line of transmission and to celebrate its importance. In doing this, the pouwhenua is also celebrating his parents with particular emphasis on his father's inter-generational knowledge transmission.

The setting for the first wananga was the moon phase of Whiro of Haratua, 2021. The wananga was held overnight and held at Rangatira Ski Lodge in Ohakune. This venue was selected to help break the mode of boxing ourselves into learning only at a marae. The moon phase was selected to help seed intention and view the stars as there is no light pollution from the moon during this phase.

There were also several people that didn't know each other but knew the pouwhenua. This was important to ensure that people we put immediately into an

uncomfortable place and had to learn to work together. This required setting a culture and intention from the beginning. This was done through whakataumaha, a form of meditation taught to the pouwhenua by tohunga, Rangitihi Tahuparae. Then expectations of commitment, openness to doing things differently and readiness to learn were outlined. This was sealed with karakia at a taumata on Tohunga Station, one of the Ātiha farms near Ohakune.

#### Tohunga – Te wāhi wānanga

Tohunga was selected as the principal training ground so that the learning would be based on practical application of knowledge through observation and ceremony. In addition, by using the farm, we would work with the Ātihau farm staff and board and Ngāti Rangi iwi environmental unit to apply the knowledge of Tai-o-Rongo.

# Tohunga – He wāhi tūpuna

Tohunga hill is an ancient wāhi tūpuna and archaeological site near Ohakune. It connects to the Ngāti Rangi tupuna, Ururangi. It was founded by his tupuna, Whiro who is also connected to Te Rangiwānangananga (noted above) and Tuhirangi, near Waiouru. Te Wiwini-o-Tū is at Tuhirangi and is the tūahu of Paerangi, eponymous ancestor of Ngāti Rangi. Ururangi was a tohunga kōkōrangi. The principal tūahu at Tohunga is Te Wiwini-o-Rongo, the twin tūahu to Te Wiwini-o-Tū at Tuhirangi. This site was selected as the training ground for Tai-o-Rongo.

# **Understanding Tohunga**

#### See Appendix 1 for the location layout<sup>3</sup>

Tohunga is a large complex of tūahu. It is akin to Stonehenge with its celestial alignment with geographical placement. There are four known precincts at this stage of rediscovery. Our research has included whānau manuscripts, interviews, matakite and Native Land Court minutes. This has been combined with navigational and astronomical knowledge to better understand the complex. This research has shown that the four precincts include:

<sup>&</sup>lt;sup>3</sup> Appendix 1: Location Layout of Tohunga

- Te Marama including Te Taka-a-Hineteiwaiwa (Te Taka), Te Ahu-a-Hinatemarama, Māhutonga-ki-raro, Omāhutūroa and Mātongatonga, Māuru, Omarutua;
- Takurua –Te Wiwini-o-Rongo, Hinemarangai, Ohineari, Ranginui, Rangiroa, Māhutonga (Newha, Kupuahi, Puaahi, Pauahi and Kautū-ki-te-rangi), Atutahi, Ngā Pātari, Te Wai Whakaata-a-Paerangi, Marere-o-tonga; and
- Maru Otūmaru, Tomokanga;
- Raumati Tamatehaumai, Marakirangi, Tamanui, Tama-i-te-ao-mārama, Tamaroa, Tamanui-te-rā, Te Puna-a-Matariki, Te Pahore-a-Rehua, Te Ara-a-Rehua.

As noted above, Tohunga hill is part of Tohunga Station on the Ātihau farms. Ātihau is the largest Māori farm and one of the largest contiguous farms in the country. The pouwhenua was a director on the Ātihau board from 2009-2023. While on the board, the pouwhenua was able to share knowledge with staff and the board. Over time, this resulted in a number of excursions on the farm to look at the improvements on-farm and to visit wāhi tūpuna and wāhi tapu.

Following the Haratua 2021 karakia, two weeks later, the board were visiting Tohunga to look at the new fencing for a Ngā Whenua Rāhui reserve. While in the reserve area, the pouwhenua noticed a rockcrop and recognised it was a tūahu, Te Taka-a-Hineiteiwaiwa. The pouwhenua and another director, Dr Rawiri Tinirau, acknowledged the tūahu and then carried on with the farm tour. They then went to the top of tohunga hill where Dr Tinirau found the next tūahu, Te Wiwini-o-Rongo. Again, acknowledgements were given, and the farm tour continued. The pouwhenua informed the initial Tai-o-Rongo group of the rediscovery and a group went to the farm to do further investigations. It was Caleb Lucas that found Māhutonga and the rest of the group were able to identify the other parts of the star map and Peyton Huxtable identified that Te Waiwhakaata-a-Paerangi was a replica of Ruapehu. Through observation of the rangi and whenua and reawakening our interconnection with nature and intense researh, the pieces of the jigsaw puzzle have unfolded and more people throughout the wider Whanganui confederation have spoken up about knowing about Tohunga and its 'special rocks'.

The following month, during Tangaroa Kiokio moon phase of Pipiri, Tai-o-Rongo conducted its first hautapu at Tohunga starting at Māhutonga (a star compass in the shape of Māhutonga and aligned true south-north and true east-west) and Te Wiwini-o-Rongo, the tūahu for Rongo. It was a pō roa, a term used for an overnight wānanga and ritenga (ceremony) to conduct Te Tahi o te Tau. The pouwhenua started the karakia following the pū (conch) and reo pōwhiri (female ceremonial invocation). He had planned to open Te Tahi o te Tau but instead he was moved to invoke the establishment of a whare wānanga for Tai-o-Rongo on top of Māhutonga. Once that was completed, he then started Te Tahi o te Tau. Through tūpuna intervention, this was the formal establishment of Tai-o-Rongo as a whare wānanga.

# TAI-O-RONGO RANGAHAU

Tai-o-Rongo is a place based wānanga that focuses on three knowledge spheres, termed Ngā Tai Knowledge System (Ngā Tai). Ngā Tai focuses on:

- Ngā Tai o te Rangi celestial knowledge or TUHI (all things in the sky including: the moon, sun, stars, clouds, winds, and weather patterns) and how it helps to ground and sustain humanity at place through conscious acknowledgement of seasonal change based on the celestial and elemental signs.
- Ngā Tai o te Nuku terrestrial knowledge or TOHU (all things on the land and ocean) that helps to signal changes in seasons and how this knowledge helps us to interpret at place and how significant geographical features can influence weather and how to read, record and make decisions based on terrestrial signs.
- Ngā Tai ā-tāngata (also termed Tai-o-Rongo) the importance of observation or TIROTIRO and WHAKARONGO and sharing tātai, karakia, waiata and practices that help revive a deliberate system of recording including the teaching of the traditional form of data collection through traditional and modern technology so that all tools available that are appropriate can help to revive and sustain knowledge without making the mind lazy. Ngā Tai ā-Tāngata is about the frequencies and knowledge of humanity and understanding our ability to communicate with the natural world.

Tai-o-Rongo is a holistic approach to researching and relearning how to talk to the natural world and its subtle signs, to encourage us to remember that everything is part of an interconnected symbiotic system that has flow and frequency. It is founded on a Te Ao Māori world view and sees the place of tai (water / fluid / liquid state) as paramount to universal order. We are all connected to everything around us, from the sky to the earth to the sea. According to the Māori worldview, Ranginui and Papatūānuku separation marks the beginning of humanity, and as such, all their descendants owe a duty of care to the cosmos through ancestry. It is the desire of

Tai-o-Rongo to serve as a case study which supports tangata whenua back to their whakapapa via Papatūānuku to reinvigorate their custodianship of the natural world. Korero tuku iho from which tohu are understood has a past, present and a future-allowing us to continue adapting and seeking innovative and sustainable solutions which align us as Māori to a flourishing environment and flourishing wellbeing.

This research started decades prior with the transmission of knowledge for each lead and the various participants. There are three leads with titles and then there are leads based on expertise. The three Tai-o-Rongo leads are:

- Pouwhenua: Che Wilson;
- Pou Turuturu Wahine: Meretini Bennett-Huxtable; and
- Pou Turuturu Tāne: Shiro Brown.

The pou turuturu roles focus on the balance of male and female energy and the distribution of knowledge based on gender. The roles are complementary and focus on upholding balance between tamatāne and tamawāhine. Participants are also expected to lead in their specific areas of expertise.

# TE KĀHUI O TAI-O-RONGO: He Whare Wānanga

Ngā Tohu o Tai--o-Rongo is a whare wānanga set up to focus on the revival of seasonal ritenga to help the members share with their respective communities, be that: marae, hapū, iwi, kohanga, kura and other groups. Tai-o-Rongo uses seasonal change to help members learn, share and practice the range of ritenga, pure, tohi and hākari to help grow observations that connect to ngā tuhi o te rangi (signs from the heavens), ngā tohu o te nuku (the signs from the land) and ngā tai ā-tāngata (understanding how humanity responds to the various signs).

As we remember and revive tūpuna knowledge and practices, we will also see how these teachings can be implemented on our farms (on Ātihau to start) and our iwi environmental units (with Ngāti Rangi to start) to ensure that the wānanga knowledge is then applied to real life situations over and above our own practices that we uphold at our homes.

We are using key sites within the Ngāti Rangi rohe and on the Ātihau-Whanganui Incorporation farms as our principal training ground and specifically, Tohunga Station. In addition, access to many of the sites require us agreeing to the Health and Safety procedures of those organisations.

Tai-o-Rongo is founded on the principles of the whare wānanga of Ūpokotauakī. This guides how we participate and care for each other, how we care for the knowledge and our commitment to sharing knowledge and growing our collective understanding.

The kāhui deliberately draws on a wide range of skills where there may not be natural fit but the aspiration is to connect people that are into heavenly bodies, gardening, rongoā, moana, waterways, kai gathering, arts, reo, kaupapa Māori and many more together. These various skills all come together to help us share our collective knowledge.

By bringing this eclectic mix of skills together, it provides for a form of pressure cooker to help us learn quickly and in a safe environment. The membership of Tai-o-Rongo also includes people from the geopgraphic triangle of Taumarunui to Rangitīkei to Pātea to include the iwi that traditionally worked together to foster knowledge. This triangle also aligns with the current geo-political grouping of iwi, Te Ranga Tupua.

We discuss in our literature review, with depth the opportunity that Tai-o-Rongo offers especially in the aspects of the innate transmission and dissemination of our korero tuku iho and the benefits and new opportunities for all New Zealanders as well as support for Māori taonga, culture, and identity<sup>4</sup>. Ensuring communities are empowered to drive their kaitiakitanga of their local whenua and wai encourages a shift in mindsets from understanding te taiao as individual resources to be managed, toward a Te Ao Māori understanding and korero tuku iho informed notion that humans live in sync and reciprocity with te taiao<sup>5</sup>.

Tai-o-Rongo is about long term facilitation of tāngata whenua as ecosystem managers, te Kāhui o Tai-o-Rongo, by upskilling whānau with the capability to record environmental tohu and frameworks to make judgements which are sound and specific. Resourcing a whare wānanga, our program is formally implemented with distinct duties, as well as developing a framework which is able to capture, regulate and inform decision making which considers both existing on-farm scientific data as well as environmental tohu which improve the vitality and efficiency of Awhi Farms ecosystems and performance.

Tai-o-Rongo are an ecosystem or a cross section of uri within Te Ranga Tupua that include: Ngā Tai o te Rangi: People into the celestial bodies, Ngā Tai o te Nuku: People into mahi ā-whenua, ā-wai, ā-moana, Ngā Tai ā-Tāngata: Ngā tāngata mahi kai, mahi toi, pukenga reo, pukenga karakia.

The methodology we have employed at the commencement of Tai-o-Rongo required the Pouwhenua alongside the Rangahau team to discuss the best way of building on the kāhui. A quantitative methodology we have adopted is a research methodology, featuring a baseline data survey with a recalibrated pre-survey administered before

<sup>&</sup>lt;sup>4</sup> Ataria, J., Mark-Shadbolt, M., Mead, A. T. P., Prime, K., Doherty, J., Waiwai, J., Ashby, T., Lambert, S., & Garner, G. O. (2018, 2018/10/02). Whakamanahia Te mātauranga o te Māori: empowering Māori knowledge to support Aotearoa's aquatic biological heritage. *New Zealand Journal of Marine and Freshwater Research*, *52*(4), 467-486. <u>https://doi.org/10.1080/00288330.2018.1517097</u>

<sup>&</sup>lt;sup>5</sup> Rangiwananga, N. H. R. A. (2020). Empowering mātauranga Māori to transform our understandings of freshwater management: a thesis presented in partial fulfilment of the requirements for the degree of Master's of Science in Ecology at Massey University, Palmerston North, New Zealand Massey University].

the post-survey. This design allows us to assess the impact of our initiatives aimed at preserving and revitalising Māori ancestral knowledge within agribusiness landscapes. The recalibrated pre-survey serves as a baseline measure, capturing the initial state of participants' practices, attitudes, and knowledge levels before any interventions are implemented. Following the intervention period, the post-survey provides us with insights into changes, improvements, or outcomes resulting from our efforts. While this approach does not involve continuous tracking of individuals or groups over time, it still offers valuable evidence of the effectiveness of our interventions and the extent of change observed within the research period. By comparing data from the pre-survey and post-survey, we can evaluate the impact of integrating Māori ancestral knowledge into agribusiness practices, guiding us towards sustainable and culturally informed approaches to land use and management. A qualitative element is included in this research through audio visual to demonstrate a new approach to evidential methods for research. The dissemination of this visual report will allow a wider audience outside of Māori Agribusiness to platforms where korero tuku iho and the innovation we are using may support wider research methods and frameworks.

Our baseline questions are cognisant of new concepts of thinking in terms of understanding our competency in these new spaces of Ngā Tohu o Tai-o-Rongo. The Pouwhenua acknowledges the diversity of the kāhui values that each participant brings with them kōrero tuku iho. Each participant kōrero tuku iho confirms a mutual understanding of Te Taiao, respects the values, and integrates the diverse knowledge systems in Aotearoa with collaborative and inclusive methods that embrace all expertise and perspectives. The baseline data is set out in a way to help us to understand and develop our kaupapa kōrero for each participant's current level of knowledge. This allows us to view individual levels and zoom in on supporting where specific kaupapa average might need improvement as the research project progresses.

The baseline data survey consists of 23 questions with a scaling slide from 1-10 which range in competency from unfamiliar, familiar, comfortable, confident and capable. The research epistemology is framed around knowledge systems associated with te Taiao in three key spheres – Nga Tai Knowledge System (NTKS) - Tai-o-Rongo, what is the level of understanding about Ngā Tuhi o Te Rangi (celestial

knowledge), Nga Tohu o Te Nuku (terrestrial knowledge) and Ngā Tirotiro ā Tangata (the importance of observation)<sup>6</sup>.

<sup>&</sup>lt;sup>6</sup> See Appendix 1 - Location Map

#### **Baseline Data Analysis Summary**

See Data Analysis in Appendices<sup>7</sup>

- Participation Overview: The program's surveys gathered a substantial amount of data from participants across three assessment points: the baseline survey with 28 responses, the pre-post survey with 26 responses, and the post survey with 27 responses. Sixteen participants completed all three surveys, while 26 participants completed the pre and post surveys, including the baseline for some. Notably, 10 participants were consistent in completing only the pre and post surveys. This comprehensive participation provides a robust foundation for analysing the program's impact on participants' knowledge and confidence.
- Self-Assessment Trends: The self-assessment results reveal interesting trends in participants' perceptions of their knowledge and skills. Initially, in the baseline survey, participants rated themselves unrealistically high. This overconfidence likely stemmed from a lack of awareness about the subject's complexities. However, in the pre-post survey, ratings dropped, reflecting a deeper understanding of the material's intricacies. By the final post survey, participants' ratings increased again, surpassing their initial assessments and indicating significant growth in confidence and knowledge by the end of the program.
- Categories of Familiarity: Participants' self-ratings evolved notably across the surveys. In the baseline survey, 61%-93% of participants rated themselves as unfamiliar, familiar, or comfortable, depending on the question. The pre-post survey showed 81%-100% of participants in these categories, suggesting increased familiarity. By the post survey, most participants rated themselves as familiar, comfortable, or confident, with ratings between 59%-93%. This progression underscores the program's effectiveness in enhancing participants' comfort and confidence levels.
- Areas of Strength: Several areas consistently received high ratings, reflecting participants' strengths. In the baseline survey, high scores were noted for

<sup>&</sup>lt;sup>7</sup> Appendix 2: Baseline Data Analysis

confidence in tātai, ruruku, and karakia (Question 3), knowledge of seasonal changes on the whenua (Question 10), and understanding the importance of observation (Question 16). These areas remained strong in the pre-post survey, with additional high ratings for knowledge about Ngāti Rangi (Question 23). The post survey highlighted increased knowledge about winter ceremonies like Hautapu (Question 18), continued confidence in tātai, ruruku, and karakia (Question 3), and the ability to acknowledge a tūahu (Question 5).

- Areas for Improvement: Despite the overall positive trends, certain areas were consistently identified as needing improvement. In the baseline survey, knowledge about the star compass (Question 12), ability to predict weather from stars (Question 15), and understanding summer ceremonies like Rehua Arikirangi (Question 20) were rated lowest. These areas remained challenging in the pre-post survey, along with knowledge about spring ceremonies like Matamata (Question 19). The post survey echoed these challenges, with navigation knowledge (Question 11), star compass understanding (Question 12), and weather prediction abilities (Question 15) continuing to be areas for development.
- Areas of Significant Change: Notable improvements were observed in several areas between the pre-post and post surveys. Participants' unfamiliar ratings for Question 15 (weather prediction from stars) decreased from 18 to 6, and for Question 20 (summer ceremonies) from 15 to 2. By the end of the program, no participants rated themselves as unfamiliar in Questions 3, 5, 10, and 23, demonstrating substantial growth. Additionally, there was a marked increase in confidence, particularly in Questions 4, 15, and 20, and an increase in capability ratings for Question 18 (winter ceremonies), from 1 to 9 participants.
- Overall, the program successfully enhanced participants' knowledge and confidence, particularly in complex areas that initially posed challenges. While significant progress was made, ongoing focus on navigation, star compass knowledge, and weather prediction from stars will further strengthen participants' skills in these critical areas.



# Re-remembering our indigenous division of time

An Indigenous division of time is a dynamic and living system that reflects a profound understanding of the natural world, cultural heritage, and spiritual interconnectedness. It highlights the importance of observing and respecting the rhythms of nature in daily life and decision-making processes.

**Seasonal Patterns:** Indigenous cultures often divide the year into seasons based on natural phenomena like the position of the sun, climate changes, and plant/animal behaviours. These seasons guide activities such as planting, harvesting, hunting, and gathering, aligning human actions with the rhythms of nature.

**Sun's Movement:** The sun's movement across the sky serves as a fundamental marker of time. Indigenous communities observe the sun's daily path, noting sunrise, sunset, and variations in daylight hours throughout the year. These observations help determine optimal times for various tasks and ceremonies.

**Heliacal Star Rising:** Certain stars, known as heliacal stars, are closely linked to seasonal changes. Indigenous calendars often include the rising and setting of specific stars on the horizon, signalling transitions between seasons or marking significant periods for cultural activities and rituals.

**Star Constellations:** Indigenous cultures have rich knowledge of star constellations, which they use to identify different activities, navigate landscapes, and mark important celestial events. Each constellation may have specific meanings or associations with certain times of the year.

**Moon Phases:** The moon's phases play a crucial role in timekeeping and decision-making. Indigenous calendars often track lunar cycles, including new moons, full moons, and phases in between. These phases are associated with different energies, tides, and activities, guiding agricultural practices, hunting expeditions, and spiritual ceremonies.

**Cultural Practices and Rituals:** Time division is deeply intertwined with cultural practices, storytelling, and spiritual beliefs. Indigenous communities use this division of time to plan ceremonies, honour ancestors, pass down traditional knowledge, and maintain harmonious relationships with the natural world.

**Interconnectedness with Nature:** Central to the Indigenous division of time is the concept of interconnectedness with nature. Time is not viewed as linear but as cyclical, reflecting the eternal cycles of birth, growth, death, and regeneration found in the environment.

Tai-o-Rongo started on tūpuna intervention rather than waiting for funding. Therefore, the art of observation over the year has been learnt through the revival of five seasonal ceremonies - Ngā Pou o te Tau, namely:

- Te Maru o te Tau one of two Puanga ceremonies held in Haratua. It's focus is to send the deceased of the last year to the next world and helps to reset the living before entering into the lunar new year;
- **Te Tahi o te Tau** the second Puanga ceremony held in Pipiri welcomes the lunar new year;
- **Te Matamata o te Tau** a ritenga helde in Mahuru that acknolwedges the new growth of spring;
- Te Matiti o te Tau a ritenga held in Kohitātea (te waru) that acknowledge the long days of summer and the expression of gratitude during this busy period of gathering food and resources for the colder months; and
- **Te Huatahi o te Tau** a ritenga held in Paenga Whāwhā to express gratitude for the harvest.

As the research evolved, the terms used also changed. Both the research and hui and wānanga with our neighbouring iwi, shed light on the manuscripts resulting in a change in terms over time.

#### **Original Timeline Delivery**<sup>8</sup>

	Pō Roa	Wānanga	Hui ā-motu	Rangahau
Sept-Nov 21	Matamata		Hui	Rangahau kōrero

<sup>&</sup>lt;sup>8</sup> Developed November 2021 for the initial expression of interest

Dec 21-Feb 22	Raumati Rehua			Takahi whenua
Mar-May 22	Paepae		Hui	Rangahau kōrero
Jun-Aug 22	Hotoke	Matahi		Rangahau kōrero
Sept-Nov 22	Atutahi	Matamata	Hui	Takahi whenua
Dec 22-Feb 23		Raumati Rehua		Rangahau kōrero
Mar-May 23	Heke Ngahuru	Раерае	Hui	Takahi whenua
Jun-Aug 23		Hotoke Matahi		Rangahau kōrero
Sep-Nov 23	Whitiwhiti Ora	Matamata	Hui	Takahi whenua
Dec 23-Feb 24		Raumati Rehua		Rangahau kōrero
Mar-May 24	Hauhake	Раерае	Hui	Takahi whenua

Tai-o-Rongo were to revive place-based tūpuna consciousness into contemporary contexts. This is achieved by valuing the intertwined knowledge-understanding that is applied through action. This is a re-thinking on how uri can read and record the movements and changes across the environment, in animals and our human interaction with the environment through traditional and modern methods.

# **Tupuna Intelligence begats Tupuna Frameworks**

#### Te Kura Framework

Permission to inquire from an indigenous lens is crucial due to the historical lack of recognition and integration of indigenous knowledge systems in mainstream scientific discourse. More importantly for indigenous communities permission to inquire also allows permission to engage with an applicable function.

The importance of using this method of inquiry and function in today's society lies in its ability to validate and leverage indigenous knowledge as a valuable resource for sustainable development. Scientific evidence supports the effectiveness of inquiry-based approaches in acquiring new insights and addressing complex issues, showcasing the relevance and practicality of integrating traditional wisdom into modern practices. This not only enriches the understanding of ecological systems but also promotes cultural resilience, intergenerational knowledge transmission, and holistic approaches to societal challenges, making it an essential paradigm for fostering inclusive and sustainable futures.

Inquiry within the Kura Framework and Tai-o-Rongo program involves rigorous research methodologies, knowledge generation through observation and experimentation, problem-solving strategies, and improved learning outcomes for participants. This scientific evidence supports the effectiveness of inquiry in acquiring new knowledge and addressing challenges in Māori agribusiness and environmental stewardship.

Function, as applied in Tai-o-Rongo, is evidenced through practical research that translates theoretical knowledge into real-world solutions, impact assessments that measure effectiveness, performance metrics for evaluating success, and the adaptability of traditional wisdom to modern challenges, leading to sustainable practices and positive outcomes.

The Kura Framework serves as a robust foundation for supporting and enriching the Tai-o-Rongo Rangahau, which is deeply rooted in Māori ancestral knowledge systems and practices. Through the lens of the Kura Framework, Tai-o-Rongo gains

permission for profound inquiry into the interconnected realms of Te Taiao (the natural environment) and Māori agribusiness. This permission extends beyond exploration to actionable insights, empowering participants to integrate traditional wisdom into contemporary challenges, particularly in sustainable land use and ecological stewardship.

At the core of the Kura Framework is its emphasis on functional application, aligning seamlessly with Tai-o-Rongo's objectives of capacity building and capability development. By applying traditional knowledge to practical solutions, Tai-o-Rongo equips Māori agribusinesses with the tools and insights needed to navigate complex decisions while honouring cultural heritage and environmental sustainability. This intentional application ensures that the knowledge gained from ancestral wisdom translates into tangible actions that positively impact communities and ecosystems.

The Kura Framework's focus on intentional purpose and deep engagement finds resonance in Tai-o-Rongo's collaborative ethos. Through Tūmau Marae frameworks and inclusive practices, Tai-o-Rongo fosters meaningful interactions among diverse stakeholders, including elders, knowledge holders, researchers, and industry experts. This collaborative engagement not only enriches the learning experience but also cultivates relationships, networks, and partnerships essential for the long-term success and sustainability of the Tai-o-Rongo program, creating a pathway towards a more resilient and thriving future for Māori agribusiness and communities.

#### Tumau Marae System

See Appendix 4<sup>9</sup>

For the revitalisation and application of 'Ngā Tai' the secondary component lies in developing holistic approaches to the Ātihau business model. This helped shift the focus to support the wellbeing of taiao and foster reconnection for uri. This occurred within a broader Tūmau Marae system for Tai-o-Rongo learning that includes:

- Ako learn the knowledge through practice.
- Mahi keep applying the practice to become an expert.
- Arahi lead as a practitioner; and

<sup>&</sup>lt;sup>9</sup> Appendix 4: Tumau Marae System Diagram

• Tuku – hand over to the next person to lead.

By actively living the Tūmau Marae system each time Tai-o-Rongo met it promoted the reclamation activities and rebuilding of relationships with taiao. In addition, we grew the relationships of uri to place and built the knowledge of Ātihau and Ngāti Rangi staff that work the land.

All research was guided by uri at place, in accordance with local tikanga. The methodology is the Tūmau Marae approach to research which is premised on "Tai-o-Rongo" and its central principles of:

a. **Mana honohono** – connecting to and interpreting the natural phenomena to help with decision making for Maori business and iwi entities.

**a. Mana pupuri** – protecting natural resources through the acquisition, application and transmission of knowledge;

**a. Mana kura** - using innovation to act and guide the acquisition and application of knowledge; and

**a. Mana kai** - sustaining our lives through active growing, hunting, gathering, and foraging for kai and how this can complement and change farming practices.

Transmission of knowledge has been guided by the Tūmau Marae system. This is how the pouwhenua was taught and although tweaks have been made to adapt to a new world, the essence is consistent with his experience.

#### Tūmau Marae System Detail

This is the system that is used at each marae. It may not be called this, but the practice is what happens. It is often referred to as the tangihanga factor or the marae muscle. This factor or muscle is praised in crisis and was shown during COVID-19 lockdowns and civil emergencies as well as at every tangihanga. It is tried and true and is further explained:

Tai-o-Rongo started with a group that were all younger than the pouwhenua. This was deliberate to help build a solid team that didn't have any of his generational trauma. Over the next year, the team trusted the process and more people were invited or turned up.

	Tūmau Marae Sys	stem
Concept	Interpretation	Explanation
Ako	A person is asked to come	By consciously acknowledging
Observe,	and help peel potatoes or set	and internalising the deep
hear, feel,	the table. If they don't know	consequences of ancestral
experience	how to do this task, they are	information on one's internal
	taught and shown through	state, the Ako phase provides a
	example. They are corrected	meditative and contemplative
	where needed and then left to	place in this framework. The Ako
	do their job.	phase is characterised by
		deliberate sitting, listening,
		feeling, and entering the deep
		well of ancestral wisdom. A
		person's introspection into their
		own development and the
		degree to which their own inner
		wisdom resonates with that of
		their ancestors are both aided by
		tuning into the teachings and
		traditions.
Mahi Knowing	You are left to do your task	Whānau participate in practical
/ Doing /	and are trusted to do that task.	application, evaluate the
Reviewing	Though often menial, is it still	feasibility of ideas, and reflect on
	an important cog in the wheel	the results throughout this
	for the marae to run smoothly.	Testing and Learning phase. A
		dynamic and living force in
		directing actions and decisions,
		ancestral knowledge is
		preserved via the process, which
		supports a constant cycle of
		learning, doing, and reflecting. In
		the Mahi phase, methods are

		refined based on practical
		insights, ensuring a more
		informed and successful
		approach.
Arahi	After a period, you have	Here, having pondered on our
Implementing	exhibited expertise and	Ako, Mahi, we start to apply and
/ Achieving /	leadership. This results in	cultivate it externally. We embark
Completing	being trusted to now lead a	on the journey of actively
	department within the marae.	designing, making, and
		imagining the practical
		applications of our reflections. At
		this crossroads, new chances,
		opportunities and applications
		present themselves. A
		revitalising and energising
		experience, Arahi allows us to
		put our reinvigorated resources
		to use in ways we never
		imagined possible. Here, we may
		let our imaginations run wild and
		discover things where the
		boundaries of our potentialities
		extend beyond our initial
		contemplations, opening doors to
		novel and transformative
		possibilities.
Tuku	The final component of this	When our dreams are realised,
Imagining /	system is to delegate or hand	the wisdom, expertise, and
Designing /	the job over. This is essential	achievements are passed on to
Making	to ensure succession and no	the next whānau member. Tuku
	bottlenecking occurs.	personifies the recursive process
	Key to this is the importance of	of passing down knowledge from
	handing over responsibility.	one generation to the next, which

This forces succession and is	promotes intergenerational
key to any wānanga surviving.	capacity and capability building
Fostering trust also ensures	within Whānau, Hapū and Iwi.
succession otherwise you are	The cycle then begins again.
only nurturing fear of mistakes	Pere (1982) describes traditional
and focused on control of	learning in wānanga as the
perceived power.	conviction that every individual is
	continuously engaged in the
	process of acquiring knowledge
	and imparting it. Tuku represents
	the continuation of the learning
	as whānau apply what they have
	learnt into making, designing,
	and imagining new ways
	forward.

Turning up is an important component of the wānanga as the wānanga chooses its membership. The leadership can guide the membership but if people turn up, they are welcome, and time will show who is meant to be part of Tai-o-Rongo and who isn't. This is about letting go of control and having faith that the wānanga will sift any unwanted and attract those that are needed, when needed.

#### Applying the Knowledge

Through the Tūmau Marae system, there have been several key components that have helped to solidify knowledge, namely:

- Learning new content so all are starting off at the same place.
- Adopting short tātai, karakia and reo powhiri so that people see the goal as achievable.
- Giving longer karakia, reo pōwhiri and waiata to those that are more adept.
- Emphasising repetition.
- Using karakia that can be used in several situations.
- Involving and respecting the voice of tamariki; and

• Debriefing either at the site or with a whiteboard on the return from a ritenga so that the experience is fresh and light to build moments occur.

As a deliverable of the Tai-o-Rongo rangahau, Ngāti Rangi Environmental team have adopted the use of research tools developed, to enhance their monitoring efforts of waterways and various land use activities. This integration allows them to employ a more enviro-centric informed approach to their work, as they build new methods of effective management and preservation of natural resources within their community.

#### The opportunity Tai-o-rongo presents

Post-colonial Aotearoa is piecing together lost and coded knowledge and working through issues around how to communicate kōrero tuku iho within resource management (Mead, 2016; Muru-Lanning, 2012). An intentional recovery of these knowledge spheres is underway in Aotearoa, as is a movement toward indigenous ways of knowing, sharing, protecting, and transmitting knowledge and intellectual traditions. Tai-o-Rongo is engaging with tāngata whenua to re-interpret and re-apply Indigenous values and practices into whenua, wai and farming practices. The Kaupapa serves as a container for change by holding within its Kaupapa a Whare Wānanga where tāngata whenua conserve and restore wāhi tapu (significant cultural sites) and explore and re-apply traditional place names. The way in which this work will be undertaken will ensure the integrity of Tai-o-Rongo is upheld, supporting the mouri of our whenua to thrive and flourish through creating the mechanisms and tools needed to ensure that Tai-o-Rongo is given effect in its implementation and how it is able to be applied by uri at place.

#### Connecting humans back to their ancestral lands

Māori and indigenous peoples all over the world have a strong understanding of the symbiotic relationship between whenua and hauora tāngata- unity between both which may be claimed to be the most significant characteristic of Indigenous identity (Durie, 2004). The Whanganui iwi perspective of the unity of the Whanganui River, its land, and people, is succinctly expressed here by Niko Tangaroa, Whanganui kaumatua,

"The river and the land and its people are inseparable. And so if one is affected the other is affected also... The river is the heartbeat, the pulse of our people... If the Awa dies, we die as people. Ka mate te Awa, ka mate tātou te lwi" (Office of Treaty Settlements 2014, 31).

The defining characteristic of Indigenous cultures is not colonisation but the longstanding relationship and fusion with oceans, air, land, forest and all waterways (Durie, 2004) and from this intimate connection Māori have the opportunity to revitalise a comprehensive knowledge base of their whenua's ecosystems (Rainforth & Harmsworth, 2019). Understanding tohu requires communication with all beings in the environment.

Māori are conscious of our responsibilities as kaitiaki to manaaki our whenua since whenua foster our culture, heritage, and whanau. This is something that may be understood, but few examples exist on how whānau can proactively and easily access tools and roles to reconnect to ūkaipō. We can achieve this through proactively caring for, defending, and upholding links to whenua. There are numerous types of mātauranga that may be developed, reapplied and revitalised in order to positively impact contemporary attitudes and cognitive patterns- ways of thinking (Durie, 2005).

Whilst a few advanced cultural models that combine mātauranga, conventional wisdom, and Western scientific principles have created monitoring and assessment tools, there is room within these models to express observational techniques, few case studies exist where the wholistic reconnection of people and their taiao have been facilitated with the context of mouri. Beyond application into farming activities, ways of being and thinking could be improved through the re-application of tohu and understanding where these tohu sit in the whakapapa of the natural world. The ability to apply the fluid state of wairua, which can be characterised in a variety of ways and is dependent on time and context can provide a richer and heightened awareness of the wellbeing of taiao, and one's own wellbeing.

If the physical domain is interwoven with the spiritual (Pere & Nicholson, 1991) and taha wairua, or spiritually, is the most important component of Māori wellbeing (Durie, 1994) then the "sensemaking" or "code-breaking" space needs to be created in order for the contexts of tohu and environmental information to be understood, and the knowledge learnt to be applied meaningfully. (Mercier et al., 2011) explain how it is up to the recipients of pūrākau who extract the knowledge, data, and information from pūrākau and put that into action by asking themselves *"He aha te Pü, he aha te mauri o tënei körero?" (What is the purpose and meaning behind this story?)* (Mercier et al., 2011) (p.114). The origins of our holistic approach to environmental management sits within our own Māori pūrākau. Internationally, indigenous wisdom includes information coded inside of stories- from stories of human interaction with the non-human, messages delivered by animals and visions and changes of the spirit (Bruchac, 2004). These coded sources of information derive from sources outside of humans and cannot be obtained without the aid of an intermediary (Royal, 1998).

Understanding and putting körero tuku iho in its proper context - understanding our mātauranga within its social context is different from knowing what to do in that situation (Mercier et al., 2011). Our körero tuku iho is a capsule of wisdom with encoded knowledge for context-specific data, and the wisdom is derived by understanding the surrounding context (Mercier et al., 2011). Breaking the code and understanding this context allows us to see that information is alive, chooses its own people, and decides for itself what it will reveal, when, and what it will conceal is a concept which highlights the wholistic understanding of taiao (Royal, 1998). This wholistic understanding lives within te Ao Māori, and tohu when translated in other worlds (for example Western science) can be simplified to mean sign or symbol which removes its context to the subject matter and isolates the tohu from its spiritual and cultural surrounds (Smith, 2008).

If relationships between Māori and the animate and inanimate worlds are implicit in te Ao Māori (Royal, 1998) then redrawing the blueprints of earth- watching, listening to and hearing Papatūānuku and her children- the veins of the whenua from which

Māori draw their wellbeing allows whakapapa to both the physical tohu occurring in real time, but also channels back to the philosophical and spiritual connections Māori have with tupuna and Atua. Hutchings & Smith (2020) highlight the potential of applying whakapapa to soils in remapping and enhancing how Aotearoa think and approach cultural landscapes. Within the boundaries of the environmental sphere, we might posit that tohu themselves are expressions of the mana of an Atua and their convening with other elements like humans. Relations with non-human entities such as water, plants, animals, and rocks reinforces the tiered genetic composition of the whakapapa genealogical sequence which informs how Māori establish bonds with flora, fauna, and other natural resources. Whakapapa is the relationship, lineage, or genealogy between all flora and wildlife, ecosystems, and people. Through whakapapa, Māori aim to comprehend the entire environment or system and its linkages, not just a portion of these systems, and their worldview is currently holistic and integrated (Harmsworth & Awatere, 2013). More recently research has highlighted whenua as a place of healing for Māori as whānau investigate ways to express rangatiratanga around their own hauora (Hutchings & Smith, 2020; Mark & Lyons, 2010; Moewaka Barnes & McCreanor, 2019). If a Māori world view derives from a mixture of tribal mythology and cosmology, then re-practicing ancestral ceremonies and re-understanding the belief systems of Tupuna could not only assist in ecological management but also the wellbeing of humans themselves.

#### **Reclamation of our narratives**

Indigenous scholars have asked for rectification of the numerous errors and distortions in oral traditions and local knowledge that have affected both public perceptions of the past of indigenous peoples and indigenous peoples' perceptions of themselves (Smith, 1999). Smith explains that these ideologically colonial weighted distortions imprison Indigenous people into a narrative which "does not connect with either our oral traditions or our lived reality" (Smith, 1999). Centering Māori in the retelling and revitalising of Māori narratives around their whenua and the natural phenomena occurring within them can support the way in which the understanding of natural and social worlds are ordered and interact. Whenua is

"...a continuing source and manifestation of tribal and hapū mana histories, demonstrating a longstanding Māori physical and spiritual allegiance to the ancient landscape. Tribal and hapū use of such past knowledge is re-iterated as central to mana whakapapa linkages of tribes to land" (Keenan, 1994, p. xxiv).

Pūrākau are Māori narratives and a form of storytelling which can be used as a method and a lens to analyse information (Lee, 2009). This is important as these stories "serve to connect the past with the future, one generation with the other, the land with the people and the people with the story" (Smith, 1999) (p. 145). Our creation stories include cosmological accounts which have risen from deep contemplation and observation by our tupuna (Walker, 1990). Our narratives hold the critical context from which we can make sense of our iwi narratives and re-interpret them in the contexts of our contemporary lives. On farms, these narratives can provide contextual frames for the tohu being observed.

Pūrākau incorporate philosophical ideas, epistemology cultural norms, and belief systems that are essential to our identity as Māori (Lee, 2009). (Walker, 1992) successfully conveys the underlying meaning of how kōrero pūrākau were employed as a paradigm for communicating and teaching our creation myths, philosophies, and values—our worldview—in a way that allowed Māori to comprehend deep and spiritual narratives more fully. For example, when we speak of Te Kore- or nothingness, in a Māori world view 'nothingness' is perceived in a way non-Māori may not understand. To us, it meant a "time of great contemplation, a time of latent potential" (Walker, 1990) (p.11).

Given government attempts to create a cogent and alluring Aotearoa New Zealand food story for international markets (Pawson, 2018), In the context of Māori agribusiness, developing whakapapa stories of our kai and farming practices could provide a competitive edge in these markets as well as inspiring whānau, hapū and non-Māori alike through sharing kai provenance stories (Hutchings et al., 2020). Kaitiakitanga foodscapes or cultural landscapes reflecting distinctive and diversified cultural values are what (Hutchings et al., 2020) identified as the aspirations of their participants in a study which identified how storytelling and sharing of narratives around kai production led to more expansive ideas of how agriculture could support intergenerational food security as well as benefits to water, land and people.

#### **Reclamation of roles**

Whilst certain categories of specialised, protected information are only given to chosen members of a group among the Māori (Smith 2012), in hapū and specific Māori communities, Indigenous knowledge holders are afforded profound respect. However, amongst the academy and other spheres where Western science informs decision making, these Indigenous knowledge holders have not attained an equal level of status. Tohunga are highly skilled at reading and interpreting tohu with an ability to interact with environmental metaphors and symbols of knowledge yielding a profound level of attunement to the natural environment (Smith, 2008). Tai-o-Rongo presents a space where whanau can acquire a deep level of attunement with the natural world and put their observations into practice, thus developing a repository of knowledge and the critical evidence required to support new knowledge generation through recreating roles for whanau to participate. There is a necessity for knowledge to be handed on to the younger generation, like Māui and Tāwhaki, which is a significant role for knowledge keepers (Walker, 1992). The transmission of this knowledge is enlivened when knowledge keepers identify the next generation with the proper whakapapa and character traits to possess the mātauranga of their elders (Walker, 1992).

The Kaupapa serves as a container for change by holding within its Kaupapa a Whare Wānanga where tāngata whenua conserve and restore wāhi tapu (significant cultural sites) and explore and re-apply traditional place names. The way in which this work will be undertaken will ensure the integrity of Tai-o-Rongo is upheld, supporting the mouri of our whenua to thrive and flourish through creating the mechanisms and tools needed to ensure that Tai-o-Rongo is given effect in its implementation and how it is able to be applied by uri at place. While traditional knowledge plays a significant role in informing land management decisions, there is a paucity of research examining how its impact can be systematically measured and evaluated. Existing measurement frameworks often fail to capture the complex interplay between indigenous and Western knowledge systems, highlighting the need for more robust methodologies for assessing the efficacy of korero tuku iho in farm management contexts.

Transmission of knowledge to farm and iwi environmental staff has been easier than we expected. Iwi staff have been actively involved in the Tai-o-Rongo wānanga whereas the farm staff have required their own specific sessions.

As the iwi staff have been actively involved, things have become second nature and they are now actively using their knowledge in water and environmental monitoring. They have also been able to identify wāhi tūpuna and wāhi tapu from the training.

The monitoring aspect has meant that iwi staff now monitor as much as possible on specific moon cycles depending on the subject. More work is required to get partner groups to align to the maramataka. However, they are also applying this knowledge at home in the garden, fishing, hunting and to better interpret weather cycles.

Prior to the research, we weren't aware that the farm managers all follow the moon man. Therefore, introducing the idea of maramataka has been easy. We have worked with the apiary staff to apply this knowledge to what they are doing and have also initiated work to align with the following work:

- Putting the bull and ram out;
- Drenching;
- When to apply fertiliser and pesticide;
- When and where to plant manuka;
- When to sow crops; and
- When to plant trees for soil management.

For the wānanga group, the revival of the five ritenga has also been adopted by Te Kāhui o Puanga. This group is a regional group of Taranaki, Whanganui and Rangitīkei that are working together to establish Te Whare Tūranga Kōrero o Puanganui-o-te-rangi. This group promotes the Puanga narratives and felt it important not to just focus on one ceremony but to look at the season and how we revive a movement that is aware of observation and working out what mahi kai, food sovereignty and climate change mitigation looks like premised on monthly, seasonal and annual observations.

The positive with this wide group is that we are holding wananga and sharing and valuing the ethic of observation and it has been received positively. This helps with discussions with the Maori land and iwi entities and aligning their natural resource assets to the Tai-o-Rongo framework.

# Tai-o-Rongo: A Movement Building Framework for Climate Action

Tai-o-Rongo is a Research Whare Wananga in a traditional sense that pulls in the diversity of ancestral wisdom demonstrated across a ropū actively participating in the practice. As colonisation has isolated much of our culture in silos the dissemination has been largely mono-cultural suited to the current colonial landscape. The value of a Whare Wananga model through Taiao as a mentor and teacher allows us to once again pull on the expertise of a collective to make critical decisions. This is not a hierarchy of who knows the most but more importantly the bridging of the complexities that exist in our knowledge base. This is a sharing of knowledge of using the sum of all parts to benefit the whole.

#### Tai-o-Rongo Rangahau: He Whare Wananga

This model emphasises the importance of a collective learning environment where ancestral wisdom is shared and utilised for making critical decisions. It focuses on Taiao (environment/nature) as a mentor and teacher, allowing for the integration of diverse knowledge from a group of participants rather than a hierarchical approach based on individual expertise.

Collective Wisdom and Decision-Making: Tai-o-Rongo, embodied in the Whare Wananga model, emphasises the collective wisdom of diverse ancestral knowledge. By treating Taiao as a mentor and teacher, the framework facilitates critical decision-making processes that transcend individual expertise. This approach acknowledges that the sum of all parts contributes to the benefit of the whole, promoting collaboration and a shared understanding among participants.

Where gaps occur in the learning a special lens is necessary and in this case the specialist lens has identified a regional wide expertise forming what we now know as Puanganui o te Rangi. This whare wananga has been pulled specially to identify the lead knowledge holders in their respective regions to share and develop a collective knowledge base of Puanga. Drawing on this expertise has allowed for a development of a collective understanding whilst staying fast to the autonomy of

each region and place-based knowledge holder. Autonomy for the whole while acknowledging the importance of individualised lwi locational experience.

#### Puanganui o te Rangi: Collective of Experts

This framework involves a regional-wide expertise that identifies lead knowledge holders in various regions. It aims to develop a collective knowledge base while respecting the autonomy of each region and its place-based knowledge. This framework bridges the complexities of knowledge gaps and emphasises collective understanding.

Regional Expertise and Autonomy: Puanganui-o-te-rangi highlights the importance of regional expertise and autonomy within Tai-o-Rongo. Lead knowledge holders from different regions come together to share and develop a collective knowledge base, respecting the unique insights and experiences of each place-based knowledge holder. This framework ensures that while collective understanding is fostered, individual autonomy and the significance of locational experiences are upheld and valued.

Dissemination of these specific teachings has required a number of methods from workshops, wānanga, waiata, ruruku, written text for various audiences to ensure that a saturation of the information is as accessible as possible. One such dissemination is through the wananga of Ngā Kaupeka. A learning wānanga that uses a pedagogic approach however with the tikanga associated through Tai-o-Rongo. This method has been applied successfully including a successional approach where committed participants have been encouraged to share in the facilitation process, encouraging a positive outcome for themselves and others as they find the courage to share and disseminate the knowledge to their respective spaces.

#### Ngā Kaupeka: Application

This framework involves learning wānanga that uses a pedagogic approach aligned with Tai-o-Rongo's tikanga (protocols). It focuses on disseminating specific teachings

through various methods such as workshops, wānanga (learning sessions), waiata (songs), ruruku (interactive learning), and written texts tailored to different audiences, ensuring accessibility and successful knowledge sharing.

Tai-o-Rongo's approach to knowledge dissemination, exemplified in Ngā Kaupeka, employs a variety of methods to make information accessible to diverse audiences. From workshops to waiata and written texts, the framework ensures a saturation of information that caters to different learning styles and preferences. Moreover, the successional approach encourages active participation and sharing among committed participants, fostering a positive learning environment and enabling knowledge to be disseminated effectively to various spaces and communities.

While indigenous communities possess a deep understanding of their environments and ecosystems, there is limited research exploring how this expertise can be applied within farm management contexts. The literature emphasises the importance of recognising and respecting traditional knowledge systems, but there has been limited empirical studies examining the effectiveness of incorporating te taiao (the natural world) perspectives into decision-making processes on farms, until now.

A later adaptation to the research has been the adoption of hand signals to remember and embed knowledge. This has been positively received and is a hit with all age groups. With four hand actions the key knowledge points to the essence of a seasonal ceremony are captured as well as principal focus is for that period. These practices help to embed the knowledge and help members to then understand whakataukī and other traditional codes of holding knowledge.

# Case Study: Awhi Farms building Eco-Managers on farm

Facilitation of Wānanga held at Raetihi Marae to support the Apiary Farm Management and kaimahi to engage in a new Mātauranga Māori lens to support farming practices.

For too long, Māori owned farms have followed the western approach to farming. Ātihau-Whanganui Incorporation (AWHI Farms) is one of Aotearoa's largest farms responsible for around 70,000 sheep, 4,000 beef cows, 700 dairy cows, 3,000 beehives and 728 hectares of woodlots on whānau whenua. AWHI Farms believes in a natural kinship between people and the natural environment, an inseparability of our mutual well-being. In an era where large-scale farming extracts as much as possible out of nature, AWHI Farms want to reinstate practices centred in environmental practices. As kaitiaki of our whenua, it is AWHI Farms duty to protect the vulnerable ecosystems and native flora and fauna on the 42,000 hectares of farmland, which run from Ohakune to Whanganui.

Ātihau-Whanganui in partnership with Ngā Tohu ki Tai-o-Rongo (Tai-o-Rongo) has been established to build critical evidence of tohu (environmental indicators) applied in farm management.

Tai-o-Rongo facilitates whānau and kaimahi as ecosystem managers by upskilling them with the capability to record environmental tohu and frameworks to support AWHI Farms to make judgements which are sound and specific. Tai-o-Rongo considers how might the application of tūpuna wisdom in Māori agribusiness positively impact on the taiao (natural world) and improve whānau relationships with their whenua. This place-based kaupapa engages tūpuna wisdom to foster whānau growth, to assist AWHI Farms to change farming practices and support iwi environmental aspirations. By reinstating wisdom and knowledge of our tūpuna we can understand and record weather and environmental observations through the practice of our tūpuna wisdom of karakia and ceremony. Weather and environmental data is then transferred and applied to on-farm practices for mitigating environmental and climate impacts. The programme is designed to engage whānau and kaimahi in wānanga using a research epistemology framed around knowledge systems associated with taiao in three key spheres of Ngā Tai, known as Ngā Tai Knowledge

Systems: Ngā tuhi o te rangi (celestial), ngā tohu o te whenua (terrestrial) and ngā tirotiro ā-tangata (observation).

Tai-o-Rongo recommends assessing a way to capture evidence and analyse it within a whare wananga that has been established in partnership with AWHI Farms to develop and support return of an indigenous lens to land use.

#### Maramataka Framework

Understanding how an indigenous framework like Maramataka might support Ātihau to better engage in a framework that among a plethora of things, the traditional measure of time used by our tupuna (our ancestors) that through observation, interaction and adaptation helped to refine our connection and understanding of te Taiao (our natural environment).

The testing of this framework is new and emerging in the context of Agribusiness and only a few have begun the incorporation of this framework into their farming practices (see As a practical tool used to guide all activities, from fishing, gardening, wānanga and navigation both on land and sea, the use of patterned observation of environmental factors, made sense of through tuhi (celestial indicators), tohu (terrestrial indicators) and tirotiro (human understanding culminated through thousands of years of observation) can support Ātihau-Whanganui in their farming practices.

This opportunity allows for kaimahi to weave their own understanding of environment as ecosystem managers and a level of Maramataka in the observations of the patterned behaviours and energy, to weave within the two worlds of Te Ao Maori and Te Ao Pakeha to be autonomous in our decisions and more specifically our futures. The opportunity exists now to imagine, learn, and test new ways of thinking and observing. The science and whakapapa that exists in this framework has been developed over millennia by our tūpuna and is multi-layered. Understanding how to work more productively with an indigenous frame of time means working in association with our tuakana, te taiao, the natural environment. This is easier to incorporate in a farming practice that relies on its understanding of the natural environment.

The discoveries that Maramataka allow, is that weather conditions are completely outside our control, however prediction of weather and our ability to gain insight from the patterned observations and adapt could be a critical lesson for Ātihau-Whanganui to maximise their agribusiness activities on. Code breaking of environmental observations is still in its iterative form, however the focus of this environmental phenomenon is capable in the early stages to prototype as a fail-safe mechanism, low cost and low risk management for animal husbandry. This may look like the moving of stock to higher grounds when indication of rain is identified.

This Framework was unpacked with the kaimahi during the wananga and will be further explored alongside the insights captured during the wananga however a framework has been developed from the needs of the kaimahi to get an early start in tracking observations<sup>10</sup>.

#### **Developing an Observation Platform**

Looking ahead Tai-o-Rongo will need to meet with the Farm Managers first to go over the work plan that was developed and then cross this with a lens of maramataka. This will be used to develop a prototype to test for the upcoming season.

Project	Output	Description
Wānanga	Wananga	Opportunities to understand the role of kaimahi
	tuatahi	as ecosystem managers on AWHI Farms
Develop	Maramataka	Understanding the current scope of farm
Framework		management

<sup>&</sup>lt;sup>10</sup> See Appendix of Maramataka Framework

		Collect data and narratives on tohu from
		observation and shared kōrero with Ātihau
		participants
		Draft a framework
Design	Sense Making	Correlation of maramataka as a framework
Framework		
Wananga	Wananga tuarua	Circulate report amongst mātauranga
		contributors and incorporate feedback
Prototype	Incremental	Workplan prototype development
	introduction	Co-develop a research plan for the coming
		season
Wananga	Wananga	Reflection and adaption before honey flow
	tuatoru	season
Wananga	Wananga	Reflection and adaption after last harvest
	tuawha	
Evaluation	Evaluation of	SWOT Analysis of prototype
	framework	Adaption and reset

Wananga - Identify key tohu relating to the Ātihau honey landscape;

Output	Description
Maramataka	Correlation between the maramataka and bee
	behavioural patterns
Environmental	Correlation between observable weather features and
understanding	bee behaviour
	Correlation between observable weather features and
	flowering
	Correlation between timing of flowering of plants in
	relation to mānuka (prediction)
Sense Making	What do we know and what opportunities exist?
Report	Collate mātauranga on identified tohu into a report

Developed Resource is attached as Appendix

Overwhelming response from kaimahi in the recognition of their role as ecosystem managers has allowed for an increase in management looking to korero tuku iho to support farm practices. Dissemination of Ātihau involvement within Tai-o-Rongo can be found in their publications and as Tai-o-Rongo continues forward the partnership with Ātihau has become more formidable than ever.

The incorporation of Kōrero Tuku Iho into land management practices at Awhi Farms holds immense potential for promoting flourishing relationships between whānau, land, and taiao. By leveraging ancestral wisdom and cultural narratives, Awhi Farms can pioneer sustainable land management approaches that honour both tradition and innovation. Moving forward, further research and collaboration are needed to develop and refine measurement frameworks, strengthen expertise in reading the needs of te taiao, and foster synergy of an indigenous worldview. Through these efforts, Awhi Farms can serve as a beacon of indigenous-led innovation in land stewardship, inspiring positive change for generations to come.

### **Case Study: Code Breakers**

Tangi te kawekawea waiho kia tangi ana. Tangi te wharauroa waiho kia tangi ana E tatari atu ana, kia aroaro mahana Ka taka mai te āhuru. Koia! The Kawekaweā calls, let them call The Pipiwharauroa calls, let them call We wait for the warm periods to come To prepare ourselves, to dig!

This tātai that stems from the Whanganui and Taranaki regions sets a new lens of kōrero tuku iho when given the opportunity to explore the relational connection of people to taiao. Within this tātai we begin to see the words of the environment as a practical function. Breaking down the tātai we identify *Kawekaweā*, *Pipiwharauroa*, a species of the Cuculidae bird family (the cuckoos). The koekoea (long-tailed cuckoo) and pipiwharauroa (shining cuckoo) migrate between New Zealand and the Pacific islands, such as the Solomon Islands and Fiji. Their cryptic colouring often means they are frequently heard rather than spotted. Its unique whistling call sets it apart as well as its brooding parasitism, where the grey warbler places a foster parenting role of the pipiwharauroa. The arrival of these birds calls on the land as an indicator of spring arriving. The distinctive call of these long annual trans-oceanic migrations were heard by our tūpuna looking for distinctive patterns in their call to signal the warm days of Raumati are returning and what weather patterns might be predicted to support our preparation for mahinga kai.

Pūrakau serves as a repository for Indigenous knowledge, values, and worldviews. These stories encompass lessons about the environment, social norms, moral values, and spiritual beliefs. Through pūrakau, we have been able to ensure that cultural heritage and traditional knowledge are passed down to future generations, preserving the unique ways of knowing and being (Jenkins & Harte, 2011). Pūrakau often contain detailed information about the land, flora, fauna, and the cosmos. By learning and understanding these stories, we can read our environment more effectively. Indicated above through the migrationary return of the Pipiwharauroa, we see environmental observations of the seasonal behaviours of animals, geographical features of the land and seasonal patterns. This knowledge is critical for helping us to adapt to sustainable living and environmental stewardship (Roberts et al., 1995).

King(2008) explains how historically our people excelled in comprehending, documenting, and predicting weather and climate, which has been crucial for adapting to climatic changes in New Zealand. The deep interaction with local environments over centuries has resulted in a rich repository of environmental knowledge. This wisdom has been integrated into both traditional and contemporary practices in agriculture, fishing, medicine, education, and conservation. King (2008) discusses in his interview with kaumatua of Te Whanau a Apanui, the collective environmental knowledge, focusing on how their communities have developed and transmitted insights about local weather and climate through observations, oral histories, and cultural practices. This knowledge is essential for making decisions about weather-dependent activities and is crucial in preserving cultural heritage, solving environmental issues, and complimenting Western scientific understanding. There is a need for more advocacy for integrating Māori environmental knowledge with Western scientific approaches to enhance overall environmental management and problem-solving strategies. Tai-o-Rongo has decided to develop the use of the terminology of code breaking as we discuss more and more on the unlocking of Te Reo. Code breaking has been possible in this research programme through the development of the Kāhui. The intentional collaboration of a dynamic collective is reflective of the environment and as such our interconnected relationship with the environment. A dynamic collective from varied expertise, language exponents, scientists, traditional practitioners of the varied disciplines of waka, tatai arorangi, maramataka, taiao incorporated with kai gatherers and now agricultural expertise has allowed for an accelerated development of language codes with practical application. The sense of function of code breaking has accelerated the collective perspectives for formidably building resources and frameworks of indigenous knowledge pertaining to the environment far more relative to our interconnected relationship. Indigenous knowledge systems are deeply connected to the environment.

# Case Study: Ngā Kaupeka Wānanga

Ngā Kaupeka while a new kaupapa driven around Ngā Pou o Te Tau, was developed from much of the learnings gathered in Tai-o-Rongo pō roa and wānanga. This kaupapa however is the practical application of the practices and principles of the wānanga rangahau as tangible outcomes for whānau across the region. Utilising the expertise of the Kāhui of Tai-o-Rongo, specifically those within education, this expertise has successfully implemented the foundational practices of wānanga, kumete, `Tūmau Marae Framework' and continues to expand on the Kura Framework. The validation of the practical application into a health and wellbeing kaupapa through an education pedagogical model on Tai-o-Rongo principles has been overwhelmingly successful. The learnings captured from the evaluation of this kaupapa has successfully enabled a further funding resource at the expiry of the current contract.

What we know and have learned through literature and practical function is the practice of karakia is foundational for Māori, especially in activities such as planting or harvesting. It seeks authorisation to start a kaupapa, demonstrating respect and communication with te taiao (the environment). Pā McGowan emphasises that the land provides answers and direction, highlighting the deep connection Māori have with the land.

Participants from various wānanga, including Ngā Kaupeka, Puanganui, and Tai-o-Rongo, naturally integrated knowledge from the wānanga with their existing understandings, a theme identified as 'Mahi'. They demonstrated a strong desire to involve whānau (family) in ancestral practices, including conversing, understanding, observing, and maintaining a reciprocal relationship with te taiao. The wānanga encouraged adopting an "ancestry lens," enabling participants to perceive the environment through the eyes and ears of their ancestors, deepening their connection with taiao.

Participants shared how they returned to the marae and engaged tamariki (children) in environmental practices such as tātai (genealogy and star lore) and

communication with nature. They used traditional practices (Ritenga) to reconnect whānau with the environment, fostering a comprehensive understanding of these customs.

In the 'Arahi' theme, participants discussed adopting and adapting taiao-centric ceremonies at home. They expressed a commitment to passing these practices to future generations, ensuring the legacy of taiao engagement through ritenga continues. The concept of returning to taiao as a teacher was a recurring theme, with participants eager to bring their whānau along on this journey.

Participants highlighted their intention to maintain and share their kūmete (bowl of learnings), symbolising the ongoing transfer of knowledge. This commitment to keeping the kūmete full reflects a dedication to personal and communal well being. Participants also encouraged wider community involvement, recognizing the value of these learnings for all.

The wānanga served as a method for knowledge (re)generation and (re)application, deriving insights from both human and more-than-human sources. Participants valued the wānanga for maintaining the fullness of their kūmete, an indicator of wellbeing. The framework of Ako, Mahi, Arahi, Tuku, developed over the course of these wānanga, illustrates the flow of learning and the cyclical nature of knowledge sharing, with whānau upskilling their communities through what they have learned.

Overall, the kaupapa successfully deepened participants' connection with taiao, fostering an ancestral perspective and a forward-thinking approach. Participants are eager to return to the environment with their whānau and encourage broader community participation, enriching their relationship with taiao.

#### Recommendations

This research has slowly built momentum on how Tai-o-Rongo has been integrating Māori ancestral knowledge into contemporary agribusiness practices, particularly regarding land use and management decisions. While the whare wānanga continues to gain a powerful mobilisation of re-remembering there are many opportunities to consider as we move into a 2.0 version. This requires an enduring solidified partnership with Awhi Farms proposing the continued development of transformative approaches to Māori agribusiness that prioritise and embody ancestral knowledge systems, fostering sustainable relationships with te taiao.

#### **Training and Skill Development**

Establish training programs tailored to the needs of whānau and land stewards at Awhi Farms, focusing on key areas such as interpreting kōrero tuku iho, reading environmental indicators, and implementing regenerative land management practices.

Collaborate with indigenous knowledge holders, researchers, and community leaders to co-design and deliver culturally relevant training modules that integrate traditional and modern knowledge systems.

#### Knowledge Exchange and Sharing

Facilitate knowledge exchange platforms, such as wānanga (learning gatherings), hui (meetings), and online forums, where whānau and land stewards can share experiences, insights, and best practices in land stewardship.

Encourage intergenerational learning and mentorship relationships, where elder knowledge holders pass down ancestral wisdom to younger generations, fostering continuity and resilience in land management practices.

#### **Resource Mobilisation and Support**

Secure funding and resources to support the implementation of Korero Tuku Iho-based land management initiatives, including research projects, infrastructure development, and community engagement activities. Provide technical assistance and advisory services to whānau and land stewards, helping them navigate regulatory requirements, access funding opportunities, and develop sustainable business models for land-based enterprises.

#### Partnerships and Collaboration

Forge partnerships with academic institutions, government agencies, non-profit organisations, and industry stakeholders to leverage complementary expertise, resources, and networks in advancing the goals of the Tai-o-Rongo. Engage in collaborative research projects, pilot initiatives, and knowledge-sharing initiatives that contribute to the evidence base for Kōrero Tuku Iho-based land management practices and their impact on environmental sustainability and community well-being.

#### **Monitoring and Evaluation**

Develop robust monitoring and evaluation frameworks to assess the effectiveness and impact of the Tai-o-Rongo in building the capabilities and capacities of whānau and land stewards.

Collect qualitative and quantitative data on knowledge acquisition, skill development, behaviour change, and socio-economic outcomes, using participatory approaches that empower communities to define and measure success on their own terms.

#### Conclusion

Despite evidence suggesting the benefits of incorporating traditional knowledge into land management practices, there has been a lack of comprehensive frameworks for effectively integrating korero tuku iho into environmental management strategies. Existing studies highlight the potential of traditional knowledge to enhance biodiversity and promote sustainable land use practices, but further research is needed to develop practical methodologies for implementation.

While early stages presently and full activation of this planning resource for tohu identification is yet to be launched the development of resources for whānau can support kaimahi to make their own observations.

Collaboration between indigenous and Western knowledge systems has the potential to yield innovative solutions for sustainable land management. However, the literature lacked detailed case studies illustrating successful integration of diverse worldviews within farm management practices. Further research is needed to explore the synergies between different knowledge systems and develop frameworks for integrating traditional and contemporary approaches to land stewardship.

The gaps identified in the literature underscore the need for interdisciplinary research initiatives aimed at bridging the divide between indigenous and Western knowledge systems in farm management. By addressing these gaps, we can unlock the full potential of korero tuku into to support flourishing land management practices at Awhi Farms and beyond.

Building upon the foundation laid out by the integration of Körero Tuku Iho into land management practices at Awhi Farms, the continued development of Tai-o-Rongo is proposed to empower whānau and land stewards in fostering flourishing relationships with the land. This system aims to enhance the capabilities and capacities of individuals and communities to effectively engage with ancestral wisdom, traditional ecological knowledge, and re-engage our tupuna intelligence in land stewardship and climate action. The Tai-o-Rongo Whare Wānanga provides a comprehensive framework for empowering whānau and land stewards at Awhi Farms to become effective custodians of the land. By investing in training and skill development, fostering knowledge exchange, and sharing, mobilising resources and support, cultivating partnerships and collaboration, and implementing robust monitoring and evaluation mechanisms, Awhi Farms can create an enabling environment for sustainable land management practices rooted in ancestral wisdom and cultural values. Through collective action and collective impact, Tai-o-Rongo has the potential to catalyse transformative change, not only at Awhi Farms but also within broader communities and landscapes, contributing to the flourishing of both people and planet.

# Appendices



Te-Punga/Mahu-tonga- Southern cross Compass



Appendix 2 - Baseline Data

Naia Survey Analysis.docx.pdf Link to PDF document



# **Tai-o-Rongo** Baseline Survey Data Analysis



#### Highlights

It appears that participants gave themselves unrealistically high ratings at the start of the program (baseline survey). Then in the pre-post survey they gave themselves lower ratings, possibly due to a better understanding of the complexities of the topic. Finally, in the post survey they rated themselves more highly than in either of the previous assessments.

Other highlights include:

- In the baseline and pre-post survey, the majority of participants fall in the unfamiliar, familiar and comfortable categories.
  - o Between 61% and 93% of participants in the baseline survey, depending on which question.
  - o Between 81% and 100% of participants in the pre-post survey, depending on which question.
- In the post survey, majority of participants fall in the familiar, comfortable and confident categories (between 59% and 93%).
- Question 3 is amongst the highest across all surveys.
- Questions 15 is amongst the lowest across all surveys.
- Tohu o te Nuku:
  - o For all 3 surveys, the average score amongst the questions for this area is higher than the other two areas.
- Tuhi o te Rangi:
  - o On average, the response scores for this area are the lowest across the 3 surveys.
- Ngā tirotiro a tangata:
  - o On average, the response scores for this area are between the other two areas. However, this area grew the most between pre-post survey and post survey.

#### Survey response statistics

How many people responded to the different surveys?

- 28 total responses for the baseline survey,
- 26 total responses for pre-post survey,
- 27 total responses for post survey,
- 16 participants completed all three surveys,
- 26 participants completed the pre and post surveys (and possibly baseline as well), and
- 10 participants completed the pre and post surveys only.

Note that this report focuses on participants that completed any of the surveys.

#### Areas of strength

Highest 3: Baseline Survey:

- 1. Question 3: What is your level of confidence in tatai, ruruku and karakia
- 2. Question 10: What is your level of knowledge on seasonal changes on the whenua
- 3. Question 16: What is your level of knowledge on Ngā Tai ā Tāngata (the importance of observation)

Highest 3: Pre-Post Survey

- 1. Question 3: What is your level of confidence in tatai, ruruku and karakia
- 2. Question 10: What is your level of knowledge on seasonal changes on the whenua
- 3. Question 23: Your level of knowledge about Ngāti Rangi including whakapapa

Highest 3: Post Survey

- 1. Question 18: Your level of knowledge about ceremonies in winter such Hautapu
- 2. Question 3: What is your level of confidence in tatai, ruruku and karakia
- 3. Question 5: Do you know how to acknowledge a tūahu

#### Areas for potential improvement

Lowest 3: Baseline Survey

- 1. Question 12: What is your level of knowledge on how the star compass works
- 2. Question 15: What is the level of your ability to read and predict weather and other factors from the sighting of various stars
- 3. Question 20: Your level of knowledge about ceremonies in Summer such as Rehua Arikirangi.

Lowest 3: Pre-Post Survey

- 1. Question 15: What is the level of your ability to read and predict weather and other factors from the sighting of various stars
- 2. Question 19: Your level of knowledge about ceremonies in Spring such as Matamata
- 3. Question 20: Your level of knowledge about ceremonies in Summer such as Rehua Arikirangi

Lowest 3: Post Survey

- 1. Question 11: What is your level of knowledge of navigation
- 2. Question 12: What is your level of knowledge on how the star compass works
- 3. Question 15: What is the level of your ability to read and predict weather and other factors from the sighting of various stars

Common questions between the surveys:

- Question 20 was amongst the lowest in the baseline and pre-post surveys
- Question 12 was amongst the lowest in the baseline and post surveys
- On average, Question 15 was amongst the lowest in all surveys

#### Areas of change

Area of change between the pre-post and post survey:

- The number of participants that scored unfamiliar in Question 15 decreased from 18 to 6,
- The number of participants that scored unfamiliar in Question 20 decreased from 15 to 2,
- Question 3, 5, 10 and 23 were the only questions where there were zero participants in the unfamiliar category by the end of the programme (post survey).
- The number of participants that scored confident increased (9 or 10 participants) in Questions 4, 15, and 20.
- The number of participants that scored capable in Question 18 increased from 1 to 9.

Although, there were no questions where the average response scores decreased between the pre-post and the post survey. The following questions had the smallest increase:

- Question 9 what is your level of knowledge on seasonal changes in the moana
- Question 10 what is your level of knowledge on seasonal changes on the whenua
- Question 11 what is your level of knowledge of navigation





	Se	Seeding					Absorbing								Growing								Wee				
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Weather Prediction							-											-				-					
Star Gazing																											
Star Prediction																											
Puanga Release																											
Puanga New Year																											
Spring																											
Summer																											
Harvest												-														1	

#### Appendix 4 - Tumau Marae Framework

# Observe, hear, feel, experience

By consciously acknowledging and internalising the deep consequences of ancestral information on one's internal state, the Ako phase provides a meditative and contemplative place in this framework.

The Ako phase is characterised by deliberate sitting, listening, feeling, and entering into the deep well of ancestral wisdom. A person's introspection into their own development and the degree to which their own inner wisdom resonates with that of their ancestors are both aided by tuning into the teachings and traditions.

#### Implementing / Achieving / Completing

When tour dreams are realised, the wisdom, expertise, and achievements are passed on to the next whanau member. Tuku personifies the recursive process of passing down knowledge from one generation to the next, which promotes intergenerational capacity and capability building within Whanau, Hapù and Iwi.

### Knowing / Doing / Reviewing

Whànau evaluate results ti A dynan decision process, learning in the M practica success

Whanau participate in practical application, evaluate the feasibility of ideas, and reflect on the results throughout this Testing and Learning phase. A dynamic and living force in directing actions and decisions, ancestral knowledge is preserved via the process, which supports a constant cycle of learning, doing, and reflecting.

In the Mahi phase, methods are refined based on practical insights, ensuring a more informed and successful approach.

#### Imagining / Designing / Making

Here, having pondered on our Ako, Maki, we start to apply and cultivate it externally. We embark on the journey of actively designing, making, and imagining the practical applications of our reflections. At this crossroads, new chances, opportunities and applications present themselves. A revitalising and energising experience, Arahi allows us to put our reinvigorated resources to use in ways we never imagined possible. Here, we may let our imaginations run wild and discover things where the boundaries of our potentialities extend beyond our initial contemplations, opening doors to novel and transformative possibilities.