TE PŪTAHITANGA

A TIRITI–LED SCIENCE-POLICY APPROACH FOR AOTEAROA NEW ZEALAND

Participants at Māori STEAM hui, Waipapa marae, November 2019. Credit: BilyWong

TE PŪTAHITANGA[1]

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1 Te Pūtahitanga can be considered a 3rd space, liminal space, or interface – a space between worlds. Hutchings, J. (2012). Our lands, our water, our people. Guest editorial. Special Indigenous edition. *New Genetics and Society*, 31(1), 1–9.

SUPPORTED BY:

RAUIKA MĀNGAI

ACKNOWLEDGEMENTS

We are grateful to Professor Dame Juliet Gerrard, the Prime Minister's Chief Science Advisor, for her support to produce this paper, and to Jo-Anne Hazel of Relate Strategic for her assistance.

We are also extremely grateful to Di Grennell who provided insightful feedback on an earlier draft of this paper. Kei te māreikura, tēnei tonu mātou e mihi atu nei ki ā koe, mōu kua tukua mai e koe o whakaaro nui, whakaaro rangatira kia pai ai te takoto o tēnei kaupapa. Mā te mōhio ka mātau, mā te mātau ka mārama, ka puta ka ora tātou Te Iwi Māori.

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PURPOSE

This paper examines the interface between science and policymaking and calls for a policy approach that is enabled by, and responsive to, Te Tiriti o Waitangi and Mātauranga Māori. For a science sector to have its greatest reach and impact for all citizens, it must demonstrate relevance, accessibility and inclusion. In Aotearoa, there has been concern about the exclusion of Māori and Pacific expertise from science advice and key decision-making roles. Te Tiriti offers a powerful framework for connecting systems and communities of knowledge in ways that are mutually beneficial and future focused.

THE SCIENCE-POLICY INTERFACE

The nexus between science and policymaking has a significant impact on how the Crown determines the future of Aotearoa. Public policy sets the rules by which the country functions, while science advice provides evidence and helps to set the direction. Māori have had limited opportunities to influence the science-policy interface, and this has been particularly evident during the COVID-19 pandemic. There are several compelling reasons for why this must change.

Currently, the mainstream view of the science-policy interface values objectivity and universality, draws sharp boundaries between knowledge and action, and situates experts outside of communities. This is in stark contrast to a Te Ao Māori approach which sees knowledge and action as intertwined, is open to different forms of knowledge and expertise, and values tikanga as a guide to ethical behaviour.

A major re-think of the science-policy interface is needed to reflect Te Ao Māori perspectives, aspirations, and priorities.

TOWARDS A TIRITI–LED SCIENCE-POLICY APPROACH

While the Crown's constitutional responsibilities under Te Tiriti have yet to be realised at the science-policy interface, the timing is right for change. The Public Service Act 2020 requires the Crown to actively support its relationship with Māori under Te Tiriti, and this sits alongside other Government changes that signal a similar intent. Partnership (relational) and autonomous (rangatiratanga) approaches are needed at the science-policy interface to drive positive Māori outcomes. A Tiriti–led approach would:

- strategically invest in research, science and innovation (RSI) that continues to drive Aotearoa toward equitable health and well-being outcomes, while addressing the ongoing harms caused by colonialism and racism
- resource and support innovation in the Māori/Indigenous economic sector in ways that create future opportunities and drive more equitable economic outcomes
- resource and support autonomous Māori science advice and decision-making alongside iwi-Crown partnership approaches
- invest in Māori trained researchers who work in the RSI sector and beyond – for example, in Iwi Research Centres – as decision-makers exerting their rangatiratanga
- recognise and support iwi, hapū and diverse Māori communities as knowledge holders, policymakers and critical enablers of individual, collective (including whānau) and environmental well-being
- genuinely value and utilise two of Aotearoa's rich knowledge systems – Western science and Mātauranga Māori – so that scientific advice, and the policy that it informs, is relevant and

draws from multiple sources of evidence

- encompass measurements of science excellence and impact that are inclusive of Mātauranga Māori and widen the impact of science delivery for all Aotearoa
- develop Māori-controlled data infrastructure that meets Māori data sovereignty best practice and supports wise decision-making.

RECOMMENDATIONS

We identify five priority recommendations to support the operationalisation of Te Tiriti at the science-policy interface:

Short Term (1–2 years)
1. Develop Tiriti-based guidelines for RSI funding. These guidelines should support funding agencies to understand and meet their Tiriti obligations and opportunities with respect to their investments in RSI.
2. Appoint Māori Chief Science Advisors in key government departments. Start with departments that have a demonstrated commitment to Te Tiriti and strong relationships with iwi and Māori organisations and communities. The Māori Chief Science Advisors (CSAs) should be resourced to connect and extend cross-agency Māori science leadership capacity.
3. Strengthen monitoring of Māori RSI investment and activity. Co-determine a cross-government approach to guide departments on how they can transparently evaluate, measure and report on how their investments contribute to positive Māori outcomes. There should be a clear pathway for increased investment in Māori-led RSI.
Medium Term (3–5 years)
4. Establish a Mātauranga Māori Commission/Entity. The Commission would sit outside of the public service, with autonomous governance and baseline funding. It would provide leadership over Mātauranga Māori including Māori knowledge priorities that extend beyond the RSI sector.
5. Develop a plan for regionally based Te Ao Māori policy hubs. These hubs would identify iwi, hapū and community policy priorities and needs, and provide Māori thought leadership for medium- and long-term strategic development that extends beyond election terms. The Māori CSAs would be key connectors between the hub, Māori researchers, community-based pūkenga (experts), and policymakers.

SELECT GLOSSARY

kaitiaki – a person, group or being that acts as a carer, guardian, protector and conserver

manaakitanga – the process of showing respect, generosity and care for others

mana motuhake – mana through self-determination and control over one's own destiny

Mātauranga Māori – Māori knowledge ecosystem underpinned by kaupapa and tikanga Māori

tauiwi – non-Māori

taonga species – a term used by the Waitangi Tribunal in Wai 262 to refer to species of flora and fauna that are significant to the culture or identity of iwi or hapū.[2] For example, because there is a body of inherited knowledge relating to taonga species, they are related to the iwi or hapū by whakapapa, and the iwi or hapū is obliged to act as their kaitiaki

taonga works – a term used by the Waitangi Tribunal in Wai 262 to refer to the tangible and intangible expressions of Māori artistic and cultural traditions, founded in and reflecting the body of knowledge and understanding known as Mātauranga Māori. Examples of taonga works include haka, karakia, waiata, weavings, carvings, tā moko and designs

tikanga – the customary system of values and practices that have developed over time and continue to evolve and are deeply embedded in the social context

whakapapa – layers of genealogical connections; in Te Ao Māori, whakapapa is the basis of

Participants at Māori STEAM hui, Waipapa marae, November 2019. Credit: Billy Wong

2 These definitions have yet to be accepted by iwi and hapū.

INTRODUCTION

PURPOSE OF THIS PAPER

This paper examines the interface between science and policymaking and calls for a science-policy approach that is enabled by, and responsive to, Te Tiriti o Waitangi and Mātauranga Māori.[4], [5] To address salient and complex issues and enhance societal well-being, it is critical that governments support the generation and application of science and knowledge. For a science sector to have its greatest reach and impact for all citizens, it must demonstrate relevance, accessibility and inclusion.[6] More importantly, it must be suitably oriented to meet the multidimensional, and often intersecting, nature of the challenges faced.[7]

Two key features distinguish this country's research, science and innovation (RSI) system and its wider settings from those of other wealthy, technologically advanced nations: Te Tiriti and Mātauranga Māori. Both are currently undervalued and under-resourced. For Aotearoa New Zealand (Aotearoa) to thrive, we need a system-level response that mobilises and invests in our distinctive strengths for the benefit of all. This requires the courage and foresight to formulate and implement approaches that set new precedents in the international landscape for knowledge mobilisation.

CALL FOR A TIRITI–LED SCIENCE-POLICY APPROACH

The call for a Tiriti-led science-policy approach is timely. The establishment of the Office for Māori Crown Relations | Te Arawhiti has put the public sector on notice that it needs to develop and implement policies and practices that "realise the true promise of Te Tiriti o Waitangi".[8], [9] The Public Service Act 2020 requires that the public service support the Crown in its relationships with Māori under Te Tiriti.[10] This is not simply a matter of compliance. As Aotearoa's founding document, Te Tiriti offers a powerful framework for connecting systems and communities of knowledge in ways that are mutually beneficial and future focused.

Ki te kāhore he whakakitenga ka ngaro te iwi[3]

Without foresight or vision, the people will be lost

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3 This is a tongikura or proverbial saying from Kīngi Tāwhiao Pōtatau Te Wherowhero

4 We define science to include the humanities, engineering and technology alongside the biological, physical, mathematical and social sciences.

5 Orange, C. (1987). *The Treaty of Waitangi* (2nd ed.). Allen & Unwin.

6 Sarki, S., Niemelä, J., Tinch, R., van den Hove, S., Watt, A., & Young, J. (2014). Balancing credibility, relevance and legitimacy: A critical assessment of trade-offs in science–policy interfaces. *Science and Public Policy*, 41(2), 194–206.

7 Parkhurst, J. (2017). *The politics of evidence. From evidence-based policy to the good governance of evidence*. Routledge.

8 https://www.tearawhiti.govt.nz/

9 The public sector includes local government, the state sector (e.g., offices of Parliament, Tertiary Education Institutions), state services (e.g., Crown Entities, NZ Police, Reserve Bank), and public service (e.g., government departments). See https://www.publicservice.govt.nz/resources/what-is-the-public-sector/.

10 Section 14. The Act can be accessed at http://www.legislation.govt.nz/act/public/2020/0040/latest/LMS106159.html.

Internationally, there is growing acknowledgement that drawing on a singular, Western knowledge system to address complex challenges, such as climate change, is a folly.[11]

The relevance of Mātauranga Māori for understanding and addressing many of the current dilemmas that we face as a nation is gaining wider acceptance.[12] Māori have a long legacy as scientists and policymakers,[13] using tikanga and Mātauranga to scrutinise and understand the natural world and realise collective goals. Nearly a decade on from the landmark Waitangi Tribunal report *Ko Aotearoa Tēnei*,[14] the Government has committed to working with Māori to protect taonga species, taonga works and Mātauranga Māori in ways that support Māori rights and interests and enable Māori to derive collective benefit.[15] This commitment accords with Government obligations under the Convention of Biological Diversity with respect to access and benefit sharing.[16] Both of these developments have implications for how the RSI sector and policymakers understand and make use of science.

In many countries, including Aotearoa, the COVID-19 global pandemic has put the relationship between science and policy in the spotlight.[17] Epidemiologists, statisticians, social scientists and others have played a crucial role in providing advice to counteract the spread of the novel coronavirus and manage the consequences. However, the pandemic has also revealed fissures in the science-policy system. Maintaining public trust in the quality and efficacy of the evidence is challenging when the science is often incomplete and evolving.[18] The 'infodemic' that has accompanied the pandemic, the proliferation of conspiracy theories,[19]

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11 Jones R. (2019). Climate change and Indigenous Health Promotion. *Global Health Promotion*, 26(3), 73–81.; Lewis, D., Williams, L. & Jones, R. (2020). A radical revision of the public health response to environmental crisis in a warming world: Contributions of Indigenous knowledges and Indigenous feminist perspectives. *Canadian Journal of Public Health*, 11,897–900; Gavin, M. C., McCarter, J., Mead, A., Berkes, F., Stepp, J. R., Peterson, D., & Tang, R. (2015). Defining biocultural approaches to conservation. *Trends in Ecology & Evolution*, 30(3), 140–145; Monfreda, C. (2010). Setting the stage for new global knowledge: Science, economics, and indigenous knowledge in 'The Economics of Ecosystems and Biodiversity' at the Fourth World Conservation Congress. *Conservation and Society*, 8(4), 276–285; Aronson, S. M. (2007). Local science vs. global science: *Approaches to Indigenous knowledge in international development (Vol. 4). Berghahn Books.*

12 Arguably, Māori knowledge has shown itself to "know more than science about very complex phenomena, such as the essential nature of a human being, or the mysteries of reality." Stewart, G. (2019). Mātauranga and putaiao: The question of 'Māori Science'. *New Zealand Science Review*, 75(4), 66. See also: Lambert, S., Waipara, N., Black, A., Mark-Shadbolt, M., & Wood, W. (2018). Indigenous biosecurity: Māori responses to kauri dieback and myrtle rust in Aotearoa New Zealand. In J. Urquhart, M. Marzano & C. Potter (Eds.), *The human dimensions of forest and tree health* (pp. 109–137). Palgrave Macmillan; Whaanga, H., Wehi, P., Cox, M., Roa, T., & Kusabs, I. (2018) Māori oral traditions record and convey Indigenous knowledge of marine and freshwater resources. *Journal of Marine and Freshwater Research*, 52(4), 487–496.

13 Morgan, K. & Manuel, R. (2020). Western science and Indigenous wisdom: Is integration possible, practical, plausible? *New Zealand Science Review*, 76(1–2), 6–12; Whaanga, H., Harris, P., & Matamua, R. (2020). The science and practice of Māori astronomy and Matariki. *New Zealand Science Review,* 76(1–2), 13–19.

14 Waitangi Tribunal. (2011). *Ko Aotearoa tēnei: A report into claims concerning New Zealand law and policy affecting Māori culture and identity.* Waitangi Tribunal.

15 Papers relating to Cabinet decisions on a whole-of-government work programme to address the issues raised in the Wai 262 claim can be accessed at https://www.tpk.govt.nz/en/a-matou-mohiotanga/cabinet-papers/developing-a-wholeofgovernment-strategy-for-wai-26. See also: https://www.tpk.govt.nz/en/whakamahia/un-declaration-on-the-rights-of-indigenous-peoples.

16 Article 15 of the Convention requires governments to develop an ABS regime, and Article 8(j) requires that, in doing so, governments give due consideration to the role of kaitiaki and traditional knowledge holders.

17 Holmes, E. A., O'Connor, R. C., Perry, V. H., Tracey, I., Wessely, S., Arseneault, L., & Ford, T. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *The Lancet Psychiatry*, 7(6), 547–560; Matthewman, S., & Huppatz, K. (2020). A sociology of Covid-19. *Journal of Sociology*, 56(4), 675–683.

18 Dooren, W. V., & Noordegraaf, M. (2020). Staging science: Authoritativeness and fragility of models and measurement in the Covid-19 Crisis. *Public Administration Review*, 80(4), 610–615.

19 Ngata, T. (2020, August 9). The rise of Māori MAGA. E-Tangata https://e-tangata.co.nz/comment-and-analysis/the-rise-of-maori-maga/

and distrust in mainstream media have added to the complexity. Issues of misinformation, disinformation and mal-information are linked to international patterns, [20] but also have features that are distinctive to Aotearoa.[21]

The uneven impacts of the pandemic on marginalised populations have also raised questions about the relevance and applicability of science advice that is formulated in their absence.[22] In Aotearoa, there has been concern about the exclusion of Māori and Pacific expertise from science advice and key decision-making roles.[23] While the boundaries between science and policy are inherently political and contested, [24] a limited understanding of Mātauranga Māori and Māori research methodologies – including Kaupapa Māori methodologies[25] – accounts for some of the barriers. Others are maintained by entrenched values that serve to marginalise the role of Māori research in policymaking, along with views that are clearly discriminatory or racist.[26]

A top-down model that is not adequately informed by Māori voices retains its intellectual blind spots and weakens the relevance of scientific conclusions. This, in turn, can undermine positive outcomes for Māori and reinforce beneficial outcomes for groups that are already privileged. The opportunity is to redefine science-policy expertise and capability to realise the inherent strengths and innovation that comes with leveraging multiple knowledge systems and lived experiences.

Globally, and within the Asia-Pacific region, there is increasing recognition of the need to incorporate diverse knowledges in developing policies and solutions for sustainable and inclusive growth. [27] In Aotearoa, there is a growing appreciation of the value and contribution of the Māori economy,[28] the opportunities for the RSI sector to better support Indigenous-led innovation,[29] and the largely untapped potential for Indigenous-to-Indigenous collaboration.[30]

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20 Misinformation refers to erroneous information where there was no intent to cause harm, disinformation is distributed with the intent to cause harm to a particular person or broader collective and mal-information is where the information may be correct but is used with the intent of causing harm. Berentson-Shaw, J., & Elliott, M. (2020). *Misinformation and COVID-19: A briefing for media.* https://www.theworkshop.org.nz/publications/misinformation-and-covid-19-a-briefing-formedia

21 Soar, M., Smith V. L., Dentith, M. R. X., Barnett, D., Hannah, K., Dalla Riva, G. V., & Sporle, A. (2020). *Evaluating the infodemic: Assessing the prevalence and nature of COVID19 unreliable and untrustworthy information in Aotearoa New Zealand's social media, January–August 2020*. https://www.tepunahamatatini.ac.nz/2020/09/06/covid-19_disinformation-in-aotearoa-new-zealand-social-media/

22 Boulton, A., & Te Kawa, D. (2020). Raising waka, and not just yachts. In K. Windelov, A. Fromm & S. Austen Smith (Eds.), *Progressive thinking: Ten perspectives on possible futures for public and community services.* Public Service Association of New Zealand.

23 Cormack, D., & Paine, S-J. (2020, 15 May). Dear epidemiology: A letter from two Māori researchers. *The Pantograph Punch;* Jones, R. (2020, May 13). Covid-19 and Māori health: 'The daily 1pm briefings have been an exercise in whiteness', The Spinoff; Kukutai, T., McIntosh, T., Moewaka Barnes, H., & McCreanor, T. (2020). New normal – Same inequities or engaged Te Tiriti relationship? *MAI Journal*, 9(4).

24 Boykoff, M. T., & Goodman, M. K. (2015). Science (and policy) friction: How mass media shape US American climate discourses. In B. Sommer (Eds.), *Cultural dynamics of climate change and the environment in northern America* (pp. 189–205). Brill; Mitchell, G. R., & Paroske, M. (2000). Fact, friction, and political conviction in science policy controversies. *Social Epistemology*, 14(2–3), 89–107.

25 Pihama, L., Cram, F., & Walker, S. (2002). Creating methodological space: A literature review of Kaupapa Māori research. *Canadian Journal of Native Education*, 26(1), 30–43; Walker, S., Eketone, A., & Gibbs, A. (2006). An exploration of Kaupapa Māori research, its principles, processes and applications. *International Journal of Social Research Methodology*, 9(4), 331–344.

26 Came, H., & McCreanor, T. (2015). Pathways to transform institutional (and everyday) racism in New Zealand. *Sites*, 12(2), 24–48.

27 APEC 2021 – Policy Partnership on Science, Technology and Innovation (PPSTI) hosted a policy discussion 'Leveraging diverse knowledge systems for inclusive and sustainable growth' which focused on Indigenous knowledges.

28 See, for example, berl. (2018). *Te Ōhanga Māori 2018: The Māori economy 2018*; Māori Economic Development Panel (2012). *He kai kei aku ringa – Crown-Māori economic growth partnership. Strategy to 2040.*

29 Rauika Māngai (2020). *A guide to Vision Mātauranga: lessons from Māori voices in the New Zealand science sector.* Rauika Māngai; Ruckstuhl, K., Haar, J., Hudson, M., Amoamo, M., Waiti, J., Ruwhiu, J. & Daellenbach, U. (2019) Recognising and valuing Māori innovation in the high-tech sector: a capacity approach. *Journal of the Royal Society of New Zealand*, 49:sup1, 72-88

30 Australia and Aotearoa-New Zealand Indigenous Collaboration Arrangement. https://www.tpk.govt.nz/en/a-matou-mohiotanga/culture/indigenous-collaboration-arrangement

Drawing on our collective insights and experiences working at the interface of Te Ao Māori and the RSI sector,[31] we envision a Tiriti–led approach that represents the diversity of the research environment and supports policymaking to meet the needs of Māori, and indeed all New Zealanders. Such an approach would:

- strategically invest in RSI that continues to drive Aotearoa toward equitable health and well-being outcomes, while addressing the ongoing harms caused by colonialism and racism
- resource and support innovation in the Māori/Indigenous economic sector in ways that create future opportunities and drive more equitable economic outcomes
- resource and support autonomous Māori science advice and decision-making alongside iwi-Crown partnership approaches
- invest in Māori trained researchers who work in the RSI sector and beyond – for example, in Iwi Research Centres – as decision-makers exerting their rangatiratanga
- recognise and support iwi, hapū and diverse Māori communities as knowledge holders, policymakers and critical enablers of individual, collective (including whānau) and environmental well-being
- genuinely value and utilise two of Aotearoa's rich knowledge systems – Western science and Mātauranga Māori – so that scientific advice, and the policy that it informs, is relevant and draws from multiple sources of evidence
- encompass measurements of science excellence and impact that are inclusive of Mātauranga Māori and that widen the impact of science delivery for all Aotearoa
- develop Māori-controlled data infrastructure that meets Māori data sovereignty best practice and supports wise decision-making.[32]

PAPER STRUCTURE

This paper builds on prior thinking on the RSI system and the place of Māori within it, including the recently published *A Guide to Vision Mātauranga* (2020).[33] The guide provides a strong foundation on which to progress this conversation. This paper identifies and discusses what we see as the main challenges and opportunities for Māori in the science-policy nexus and provides recommendations for change. It represents a collaborative thought-piece, produced through virtual group meetings, individual discussions and a rapid review of the literature. Many of the contributors have had long careers within Aotearoa's RSI system and have experienced first-hand the difficulties, and promise, of working at the science-policy interface. To make the most of these insights, and to emphasise key points, we include unreferenced (bolded) quotes from the authors throughout.

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31 The authors are actively engaged in science and knowledge networks across the RSI sector including the Chief Science Advisor Forum, Ngā Pae o te Māramatanga Centre of Research Excellence, Rauika Māngai (Māori working across the National Science Challenges), the Health Research Council of New Zealand Māori Health Committee, and FOMA Innovation. The views expressed in this paper do not necessarily reflect those of the institutions and/or networks with which the authors are affiliated.

32 Kukutai, T. & Cormack, D. (2020). 'Pushing the space': Data sovereignty and self-determination in Aotearoa NZ. In M. Walter, T. Kukutai, S. Russo Carroll, & D. Rodriguez-Lonebear (Eds.), *Indigenous data sovereignty and policy* (pp. 21–35). Routledge; Sporle, A., Hudson, M. & West, K. (2020). Indigenous data and policy in Aotearoa New Zealand. In M. Walter, T. Kukutai, S. Russo Carroll, & D. Rodriguez-Lonebear (Eds.), *Indigenous data sovereignty and policy* (pp. 62–80). Routledge. Te Mana Raraunga (2018). *Principles of Māori data sovereignty*.

33 See also the two special issues edited by Ocean Mercier and Anne-Marie Jackson on Mātauranga and science in *New Zealand Science Review*, 76 (1–2); Officer of the Prime Minister's Science Advisor, *Notes from the accelerating Māori in STEAM hui 2019*; Te tauihu nga taonga tuku iho communique (2019). Māori cultural and intellectual property rights. Our past, our future, our legacy.

Many of the contributors have had long careers within Aotearoa's RSI system and have experienced first-hand the difficulties, and promise, of working at the science-policy interface

Melanie Mark-Shadbolt and Meika Foster, Māori STEAM hui, Waipapa marae, November 2019. Credit: Billy Wong.

We begin by describing the dominant mainstream view of the science-policy nexus in Section 2. We briefly explore some of the challenges inherent in the status quo with a specific focus on the science-policy interface. We then describe a Te Ao Māori science-policy approach that provides for a more holistic, relational approach to knowledge, and broader concepts of science and expertise. Key here is the recognition of experts and policymakers outside of state and private sector institutions, including pūkenga (experts) within Māori communities.[34] In Section 3, we consider what a Tiriti–led science-policy approach could look like in relation to constitutional change and the place of Te Tiriti within 21st-century Aotearoa. We consider how genuine partnership might be supported in a relational space – where both partners work towards shared goals and successes – alongside a well-resourced, autonomous and unapologetically Māori approach in a rangatiratanga space. The concluding Section 4 provides a practical set of recommendations for action.

34 Paul-Burke, K., O'Brien, T., Burke, J., & Bluett, C. (2020). Mapping Māori knowledge from the past to inform marine management futures. *New Zealand Science Review*, 76 (1–2), 32–41.

SECTION 1

THE SCIENCE-POLICY INTERFACE

The nexus between science advice and policymaking has a significant impact on how the Crown determines the future of Aotearoa. Public policy "determines the rules by which opportunities are framed—what is allowed, encouraged, discouraged, and prohibited".[35] Science sector advice provides an important input into policy and thus has a crucial role to play in national decision-making and the processes that feed into it. For Māori, opportunities to influence at the interface have been limited. There are a number of compelling reasons why this must change.

This section begins by briefly describing a mainstream view of the science-policy interface that values objectivity and universality, draws sharp boundaries between knowledge and action, and situates experts outside of the community. This is in stark contrast to a Te Ao Māori approach which sees knowledge and action as intertwined rather than independent, is open to different forms of knowledge and expertise, and values tikanga as a guide to ethical behaviour. A major re-think of the science-policy interface is needed to reflect Te Ao Māori perspectives and aspirations.

A MAINSTREAM VIEW OF THE SCIENCE-POLICY INTERFACE

The science-policy interface has been described as a complex site with many actors, including politicians, policymakers, scientists, the public and media.[36] It has also been defined as:

...social processes which encompass relations between scientists and other actors in the policy process, and which allow for exchanges, co-evolution, and joint construction of knowledge with the aim of enriching decision making.[37]

The 'ideal' science-policy interface is a place where "scientific research can easily be shared with policymakers who can use it to inform decision making".[38] The reality is more complex because science is just one of many inputs into policy. As Professor Sir Peter Gluckman notes:

Policy is rarely determined solely by evidence. Policy is really made around a whole lot of considerations, public opinion, political ideology, electoral contracts, et cetera.[39]

Along with political agendas, public values play a key role.[40] Without accessible and open public discussion, values can be a complicating factor when they conflict with scientific evidence as in the cases of, for example, vaccination and fluoridation.[41]

A major re-think of the science-policy interface is needed to reflect Te Ao Māori perspectives and aspirations.

35 Bell, J. & Standish, M. (2005). Communities and health policy: A pathway for change. *Health Affairs,* 24(2), 339–342.
36 Gluckman, P. (2018). The role of evidence and expertise in policy making: The politics and practice of science advice. *Journal & Proceedings of the Royal Society of New South Wales*, 151(1), 91–101.
37 van den Hove, S. (2007). A rationale for science–policy interfaces. *Futures*, 39(7), 807–826 (p. 807).
38 Burton, E., Wang, W., & White, R. (2019). *An introduction to the science-policy interface concept: What, why, and how.*
39 Gluckman, P. (2018). The role of evidence and expertise in policy making: The politics and practice of science advice. *Journal & Proceedings of the Royal Society of New South Wales,* 151(1), 91–101.
40 Blackmore, E., Underhill, R., McQuilkin, J., & Leach, R. (2013). *Common Cause for Nature.* Public Interest Research Centre.
41 Martin, B. (2015). Censorship and free speech in scientific controversies. *Science and Public Policy*, 42(3), 377–386; Mazur, A. (2017). *Technical controversies over public policy: From fluoridation to fracking and climate change.* Routledge.

Launch of Hiwa-i-te-rangi at Karitāne, July, 2019. Credit: Anne-Marie Jackson.

Because societal institutions tend to reflect dominant values and priorities, the matter of whose values count, and what counts as evidence, is not a straightforward matter. It is well known that 'hierarchies of evidence' privilege particular kinds of knowledge over others.[42] Forms of evidence that are considered to be the most objective or scientific occupy the top of the hierarchy (e.g, randomised controlled trials). Set against this standard, Indigenous knowledge may be seen as lacking intellectual rigour or validity.[43] Indeed, some see it merely as "myth and legend, fantastic and implausible". [44] In fact, techniques used to generate Mātauranga are often aligned with empirical methodologies rooted in observation but are explained according to Māori world views. For example, Māori understandings of local ecology are based on systematic observation and experience and a relationship with specific geographies built up over generations.

The evidence hierarchy is prominent within evidence-based policymaking (EBPM) – an approach that became popular in the nineties.[45] EBPM holds that policy decisions should be based solely on evidence that is rigorous, objective and replicable. In Aotearoa, EBPM has largely been supplanted by evidence-informed policy that avoids some of the ambitious claims made by EBPM but is closely linked to pressures for more effective service delivery and greater accountability.[46]

The science advisory system has been defined as comprising academics, universities, research institutes, academic societies, professional bodies, government-employed practising scientists, scientists in policy agencies and regulatory agencies, independent think tanks, national academics, government science councils, science advisors to the executive of government and parliamentary advice units.[47] Scientists are typically placed at the apex of this system, with communities seen as the beneficiaries of their expertise. Science advisors have

42 Parkhurst, J. & Abeysinghe, S. (2016). What constitutes "good" evidence for public health and social policy making? From hierarchies to appropriateness. *Social Epistemology*, 30(5–6), 665–679; Petticrew, M. & Roberts, H (2003). Evidence, hierarchies, and typologies: Horses for courses. *Journal of Epidemiology & Community Health*, 57, 527–529.

43 Morgan, K. & Manuel, R. (2020).

44 Hikuroa, D. (2017). Mātauranga Māori—the ūkaipō of knowledge in New Zealand. *Journal of the Royal Society of New Zealand*, 47(1), 5–10.

45 N. Cartwright & J. Hardie (2012). Evidence-based policy. *A practical guide to doing it better.* Oxford University Press.

46 Head, B. (2015). Towards more "evidence-informed" policy making? *Public Administration Review*, 76(3), 472–484.

47 Fraussen, B., & Halpin, D. (2017). Think tanks and strategic policy-making: The contribution of think tanks to policy advisory systems. *Policy Sciences*, 50(1), 105–124; Gluckman, P. (2018); Heinrichs, H. (2005). Advisory systems in pluralistic knowledge societies: A criteria-based typology to assess and optimize environmental policy advice. In P. Weingert & S. Maasen (Eds.), *Democratization of expertise? Exploring novel forms of scientific advice in political decision-making* (pp. 41–61). Springer.

been described as two-way 'knowledge brokers' translating science evidence to help the policy community better understand complex issues, while also translating the needs of policymakers to the research community.[48]

In Aotearoa, the Chief Science Advisor Forum seeks (among other things) to advance the use of science to benefit Aotearoa as a whole through promoting the use of evidence to inform policy development, practice and evaluation and create a community of practice for independent science advisors across government.[49] The forum is also intended to ensure that the work of the Prime Minister's Chief Science Advisor includes important questions relevant to Māori, and include Mātauranga Māori and Kauapapa Māori approaches as part of the evidence base. There are currently only two Māori participants on the forum, one of whom is in a temporary co-opted role.[50]

PROBLEMS WITH THE STATUS QUO

The science-policy interface as described above leaves little obvious room for Māori participation or leadership. This is perhaps unsurprising given that Aotearoa's political and science systems have largely failed to recognise Māori as innovators, scientists or policymakers. A number of structural challenges continue to confront Māori within the RSI sector. These include a stark under-representation of Māori within the university workforce,[51] institutional racism,[52]a tokenistic approach to the funding and integration of Mātauranga Māori, [53] high opportunity costs arising from underinvestment in Māori-led R&D to grow the Māori economy,[54] under-representation of Māori in all disciplines including STEAM (science, technology, engineering, arts and maths),[55] and a sustained failure to meet responsibilities to Māori under Te Tiriti, the United Nations Declaration on the Rights of Indigenous Peoples,[56] and the Convention on Biological Diversity,[57] among others.

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48 Gluckman, P. (2018).

49 *Terms of Reference.* https://www.pmcsa.ac.nz/who-we-are/chief-science-advisor-forum/

50 https://www.pmcsa.ac.nz/who-we-are/chief-science-advisor-forum/

51 McAllister, T., Naepi, S., Wilson, E., Hikuroa, D. & Walker, L. (2020). Under-represented and overlooked: Māori and Pasifika scientists in Aotearoa New Zealand's universities and Crown Research Institutes. *Journal of the Royal Society of New Zealand*; McAllister, T., Kokaua, J., Naepi, S., Kidman, J., & Theodore, R. (2020). Glass ceilings in New Zealand universities: Inequities in Māori and Pacific promotions and earnings. *MAI Journal*, 9(3), 272–285; McAllister, T., Kidman, J., Rowley, O. & Theodore, R. (2019). Why isn't my professor Māori? A snapshot of the academic workforce in New Zealand universities. *MAI Journal,* 8(2), 235–249. 10.20507/MAIJournal.2019.8.2.10

52 Barnes, A. M., Taiapa, K., Borell, B., & McCreanor, T. (2013). Māori experiences and responses to racism in Aotearoa New Zealand. MAI Journal, 2(2), 63–77; Came, H. (2014). Sites of institutional racism in public health policy making in New Zealand. *Social Science & Medicine*, 106, 214–220; Came-Friar, H., McCreanor, T., Manson, L., & Nuku, K. (2019). Upholding Te Tiriti, ending institutional racism and Crown inaction on health equity. *New Zealand Medical Journal*, 132(1492), 62–66; Houkamau, C. A., & Sibley, C. G. (2015). Looking Māori predicts decreased rates of home ownership: Institutional racism in housing based on perceived appearance. *PloS One*, 10(3), e0118540; Tauri, J. (2005). Indigenous perspectives and experience: Māori and the criminal justice system. In T. Bradley & R. Walters (Eds.), *Introduction to criminological thought* (pp. 29–145). Pearson Education.

53 Muru-Lanning, M. (2012). Mātauranga Māori science, and the appropriation of water in New Zealand. *Anthropological Forum*, 22(2), 151–164.

54 berl. (2011). *Māori, science and innovation – Potential opportunity and value.* Retrieved from http://www.tpk.govt.nz/_documents/taskforce/ met-growecothruscience-2011.pdf. For a more recent overview of the Māori Economy, see https://berl.co.nz/our-mahi/understanding-maori-economy

55 McAllister, T., Naepi, S., Wilson, E., Hikuroa, D. & Walker, L. (2020); Ministry of Health. (2014). *Māori participation and attainment in science subjects (aged 15 to 17 years) 2008 to 2012.* https://www.health.govt.nz/publication/maori-participation-and-attainment-science-subjects-aged-15-17-years-2008-2012; Ministry of Health. (2013) *Māori tertiary student data.* https://www.health.govt.nz/publication/maori-tertiary-student-data

56 Kidman, J. & Chu, C. (2017). Scholar outsiders in the neoliberal university: transgressive academic labour in the whitestream. *New Zealand Journal of Educational Studies*, 52, 7–19.

57 https://www.cbd.int/doc/legal/cbd-en.pdf

The mainstream science-policy model has several features that result in Māori exclusion. One is the embedded assumption that 'West is best'.[58] Within the RSI sector generally, there is a strong belief that Western science is universal and culture-free, and that it should be as values-free as possible. The place of science is distinguished from other policy inputs by its "relative objectivity obtained through formal processes designed to limit bias in data collection and analysis".[59] It is the belief in objectivity and universality that enables Western scientists to hold their own knowledge system above others, often in a non-critical way. As Linda Tuhiwai Smith describes it:

The globalization of knowledge and Western culture constantly reaffirms the West's view of itself as the centre of legitimate knowledge, the arbiter of what counts as knowledge and the source of 'civilized' knowledge.[60]

Sustained underinvestment (and, in some cases, no investment) in Māori research infrastructure, Māori capacity and Māori science advice across the sector has further perpetuated inequities in what is considered legitimate evidence.[61] Institutional-based scientists are typically seen as the only credible source of science knowledge. Choices about what is worth evidencing, how to evidence, whose view counts, and who has resources tend to be made in favour of dominant world views. This creates closed and exclusionary loops where preferred researchers and approaches have preferential access to research, evaluation and policymakers and processes. One outcome of the narrow concept of expertise is the marginalisation of pūkenga who are recognised as experts within their communities, but who lack visibility in systems that depend on normative credentialism.[62]

The relative absence of Māori knowledge and knowledge holders at the science-policy interface is due, in part, to there being few Māori in positions of influence on either the science or policy sides of the interface. To date, policy settings appear to have had little impact on the number of Māori participating formally in the science system, implying a failure of a mainstream approach to science policy. This is also reflective of a broader education system failure, as evidenced in Māori student participation in STEM (science, technology, engineering and maths) subjects.[63] Innovative approaches to this such as Pūhoro STEM Academy, established in 2016, have experienced significant challenges in gaining sustainable funding.

Choices about what is worth evidencing, how to evidence, whose view counts, and who has resources tend to be made in favour of dominant world views.

58 Said, E. (1978). *Orientalism*. Pantheon.
59 Gluckman, P. (2016). The science-policy interface. *Science*, 353(6303), 969.
60 Smith, L. T. (1999). *Decolonizing methodologies. Research and Indigenous peoples* (p. 63). Zed Books.
61 Moewaka Barnes, H. (2006). Transforming science: How our structures limit innovation. *Social Policy Journal of New Zealand*, 29, 1-16.
62 Tomlinson, M., & Watermeyer, R. (2020). When masses meet markets: Credentialism and commodification in twenty-first century higher education. *Discourse: Studies in the Cultural Politics of Education*, 1–15; Brown, D. K. (2001). The social sources of educational credentialism: Status cultures, labor markets, and organizations. *Sociology of Education*, 74, 19–34.
63 Green, S., & Schulze, H. (2019). *Education awa: Education outcomes for Māori*. berl; Ministry of Education (2018a). *Science literary achievement: Senior secondary schooling*; Ministry of Education (2018b). *Mathematics literary achievement: Senior secondary schooling*.

This situation is not unique to Aotearoa; indeed, it is experienced by Indigenous communities around the world:

Inadequate involvement in the decision-making process results in outcomes that are externally imposed onto Indigenous communities and that fail to consider unique Indigenous perspectives, as well as the specific community context;a thus, resulting in solutions that are either not appropriate for, or not welcomed by, the community.[64]

In the early months of COVID-19, the failure to sufficiently involve Māori experts in the pandemic response raised questions about who has the authority to make decisions on behalf of Māori collectives.[65] It also surfaced wider conversations about effective mechanisms to engage non-credentialed experts and civil society stakeholders in the formulation of advice.[66]

It should be noted that the long-held frustration with systemic barriers has not diminished the desire by Māori to seek constructive, informed, Māori-led solutions that strengthen the system and deliver collective benefits to Māori and to Aotearoa. For example, in 2019, a series of national hui focused on Mātauranga Māori and Māori in STEAM. From those hui, Rauika Māngai published its guide to Vision Mātauranga,[67] representing a collective of Te Ao Māori voices across the sector. Key recommendations included a call for an engaged Te Tiriti relationship in the science sector, and an independent commission to formulate and oversee the development of a national Mātauranga Māori agenda. The Office of the Prime Minister's Chief Science Advisor also published a brief on accelerating Māori success in a STEAM-focused future.[68] Specific opportunities identified included co-designing a system-wide Mātauranga Māori Strategy and supporting Māori leadership to deliver Mātauranga Māori impact.

MĀTAURANGA MĀORI

Paternalistic approaches to Māori capacity and capability-building assume that Māori are newcomers to science and policy. Nothing could be further from the truth.[69] Polynesian voyagers exemplified state-of-the-art science and technology when they migrated across the Pacific and to Aotearoa hundreds of years ago.[70] Ngāti Kahungunu technology entrepreneur Sir Ian Taylor has written eloquently about his own discovery of Mātauranga Māori and the need for the national curriculum to make visible, and indeed to celebrate, the legacy of Māori navigational science:

To make it to these shores across Te Moananui a Kiwa, the tūpuna on my mother's side had to be more than just sailors – they had to be astronomers, astrologers, scientists, engineers, mathematicians, they had to be innovators. The voyage they made, as we are only just beginning to discover, is arguably the greatest story of human migration in the history of mankind.[71]

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64 Black, K., & McBean, E. (2016). Increased Indigenous participation in environmental decision-making: A policy analysis for the improvement of Indigenous health. *The International Indigenous Policy Journal*, 7(4), 7.
65 Johnston, K. (2020, April 19). Whose land is it anyway? *E-Tangata*; Kukutai, T., McIntosh, T., Moewaka Barnes, H. & McCreanor, T. (2020).
66 http://www.oecd.org/coronavirus/policy-responses/providing-science-advice-to-policy-makers-during-covid-19-4eec08c5/
67 Rauika Māngai. (2020). *A guide to Vision Mātauranga: Lessons from Māori voices in the New Zealand science sector.*
68 Office of the Prime Minister's Chief Science Advisor. *Notes from the accelerating Māori in STEAM hui 2019.*
69 Hikuroa, D. (2017).
70 Whaanga, H. Harris, P., & Matamua, R. (2020).
71 https://www.thevoyage.co.nz/en/landing

As tangata whenua, Māori are the kaitiaki, or custodians, of Mātauranga Māori.

Te Tira Whakamātaki pūkenga and researchers, Northland. Credit: Hayley Shadbolt.

There are many definitions of Mātauranga Māori. A particularly useful explanation can be found in Sir Hirini Moko Mead's seminal book *Tikanga Maori*, which draws on the insights of fellow scholar Whatarangi Winiata. His insights speak to the enduring but also constantly evolving nature of Mātauranga:

Mātauranga Māori is a body of knowledge that seeks to explain phenomena by drawing on concepts handed from one generation of Māori to another. Accordingly, mātauranga Māori has no beginning and is without end. It is constantly being enhanced and refined. Each passing generation of Māori make their own contribution to mātauranga Māori. The theory, or collection of theories, with associated values and practices, has accumulated mai i te Ao Māori/from Māori beginnings and will continue to accumulate providing the whakapapa of mātauranga Māori is unbroken.[72]

Many of today's Māori researchers and scientists are adept at working across knowledge systems, incorporating Mātauranga Māori as well as the knowledge sets of their discipline.[73] For nearly two decades, Ngā Pae o te Māramatanga, the only Māori Centre of Research Excellence, has been nurturing and developing cohorts of Māori researchers to work in these spaces. The methodologies and methods employed by Māori researchers at the interface are not processes of inquiry plucked from a universal playbook. Rather, they are frameworks that are intimately connected to world views that shape relationships to knowledge and practice.[74]

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72 Moko Mead, H. (2003). *Tikanga Māori: Living by Māori values.* Huia Publishers, with the assistance of Creative New Zealand.

73 J. Ruru & L. Nikora (Eds.) (2021). *Ngā kete mātauranga. Māori scholars at the research interface.* Otago University Press.

74 Moewaka Barnes, H. (2006).

Drawing on Mātauranga Māori for Economic Success

Ensuring the appropriate protection of Mātauranga Māori and taonga species is the primary underpinning theme of a new programme of work, Te Anga Whakamua. It is led by Wakatū Incorporation, a values-based, whānau-owned organisation, in partnership with the Ministry of Primary Industries, the Ministry of Business, Innovation and Employment, the Ministry of Foreign Affairs and Trade, and other government agencies. The programme aims to develop a streamlined high-value industry pathway that will facilitate Māori and wider Aotearoa businesses to engage effectively with science, technology, and innovation in the development of high-value bioactive ingredients and functional food products for health and well-being. Wakatū Incorporation is setting a precedent for Aotearoa by developing an access and benefit sharing (ABS) framework for use with its own whānau owners, guided by its 500-year intergenerational plan Te Pae Tawhiti. Māori leadership is pivotal to the success of the programme. The work is time-critical given the widespread interest across the science sector in bioprospecting and biodiscovery, which seeks to use the biological knowledge of communities to identify natural products that can be utilised in the development of commercial products.[75]

As tangata whenua, Māori are the kaitiaki, or custodians, of Mātauranga Māori. The interconnected nature of kaitiakitanga, mana motuhake and whakapapa means that Māori have both the right and obligation to protect and secure the integrity of Mātauranga. It follows then that research, funding and initiatives that promote the application and exploration of Mātauranga Māori should prioritise Māori leadership at all levels of the decision-making process. In practice, this means Māori must have leadership and oversight of funded initiatives that locate Mātauranga as central to research and innovation.

Attempts to integrate Mātauranga Māori into the RSI sector have not always been successful. Transactional funding approaches within the sector disregard the critical importance of kaitiakitanga, mana motuhake and whakapapa – Mātauranga becomes something to be extracted and used without understanding its wider context. This instrumental approach risks diminishing the mauri or life force that underpins Māori bodies of knowledge, and the wider Māori knowledge ecosystem.

75 Under current laws and policies, there is little to prevent any individual or group from conducting research, obtaining intellectual property rights in, and commercialising genetic and biological resources in taonga species, without informing kaitiaki or obtaining their consent. Aotearoa has yet to implement a bioprospecting policy and, despite ratifying the Convention on Biological Diversity in 1993, has yet to develop ABS regimes for our biological resources.

Renowned Ngāi Tuhoe leader and educationalist John Rangihau understood this risk well:

... you can see how difficult it appears for older people to be willing and available to give out information. They believe that it is part of them, part of their own life force, and when they start shedding this they are giving away themselves.[76]

Noted Waikato orator and leader the late Te Uira Manihera also spoke of the need for wise stewardship to protect against the misuse of Mātauranga:

There is a fear that by giving things out they could become commercialised. If this happens, they could lose their sacredness, their fertility. They just become common. And knowledge that is profane has lost its life, its tapu.[77]

Both John Rangihau and Te Uira Manihera were unambiguous in their sentiment – Mātauranga Māori is not a transactional commodity to be distributed and used at will. Rather, it must continue to exist at the core of whānau, hapū and iwi existence, and under the tikanga and kaupapa of kaitiakitanga. As the interface between Mātauranga and science is drawn closer together, Mātauranga must always retain the mauri of tangata whenua, and indeed of the whenua itself.

Incorporating Mātauranga Māori into Environmental Management

In recent years, a number of agencies and entities have moved to incorporate Mātauranga Māori into their decision-making in order to derive better outcomes, particularly in the area of environmental management and practice. In 2017, the Environmental Protection Authority (EPA) committed to a multi-year Mātauranga programme to help the organisation and its decision-makers understand Mātauranga Māori and its contribution to the EPA's statutory functions, including environmental decision-making.[78] This stemmed from a recognition by the organisation that understanding and weaving Mātauranga and other evidence enables well-informed decisions for Aotearoa, while fulfilling statutory obligations to Māori.

As part of the programme, a literature review of case law was commissioned. It covered 68 judgments and relevant commentary regarding effective testing and probing of Mātauranga evidence alongside semi-directed interviews with current environmental decision-makers. The review highlighted some contributing factors to errors of law that have previously led decision-makers to dismiss the validity of Mātauranga evidence. These included predetermination or bias, unconscious bias, lack of understanding, a nd the application of standards that do not allow for cultural differences. In 2020, the EPA released its Mātauranga framework and is committed to ensuring this meaningfully informs future environmental decision-making.[79]

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76 Rangihau, J. (1975). Foreword: Learning and tapu. In M.King (Ed.), *Te ao hurihuri: Aspects of Māoritanga* (pp. 12-14). Reed, p.12

77 Manihera, T. (1975). Foreword: Learning and tapu. In M.King (Ed.), *Te ao hurihuri: Aspects of Māoritanga* (p. 9). Reed.

78 The EPA is a Crown Entity.

79 *EPA Guide to the Matauranga Framework*. https://www.epa.govt.nz/assets/Uploads/Documents/Te-Hautu/Matauranga-Maori-Report_Companion-Guide.pdf

TE AO MĀORI SCIENCE-POLICY INTERFACE

Defining experts in the policy space is as important as defining what science excellence is in the science space. They are terms that hold us back because they have meaning and power within their frames.

From a Te Ao Māori standpoint, it is essential for evidence to be ethical, critical, adaptive and culturally informed – and that all communities are able to have confidence in it.[80]

For Māori, this means recognising Māori ways of knowing, being and doing, and including pūkenga situated outside of state-controlled or mandated institutions, including hapū, iwi and Māori organisations and businesses. Marae, for example, are established sites of collective policymaking and implementation across a wide range of areas including rāhui (protective exclusion zones), auahi kore (smoke-free health promotion) and para kore (zero waste).[81] The Iwi Chairs Forum has developed ongoing programmes of work that address priority kaupapa including fresh water, climate change, housing, iwi data sovereignty and constitutional transformation. National organisations such as Te Rōpū Wāhine Māori Toko i te Ora (Māori Women's Welfare League) and the New Zealand Māori Council have decades of experience working alongside Māori communities and whānau and advocating for their advancement. There is no shortage of Māori scientific and policymaking expertise beyond the bounds of the public sector.

In his book on the *Politics of Evidence*, Parkhurst argues for the need to consider institutions and processes that can enable the appropriate use of evidence for decision-making in ways that are **relevant to the local policy context.**[82] Principles help to shape what constitutes 'good evidence to inform policy' and 'the good use of evidence' within policy. There are four components:

- appropriate evidence
- accountability back to citizens
- transparency
- contestability.

Good governance of evidence should ensure that the right evidence is used within decision-making processes that are inclusive and accountable to the "multiple social interests of the population served".[83]

The focus on appropriateness, transparency, accountability and contestability resonates. In Te Ao Māori, tikanga guides important decisions about what evidence is appropriate or right for the context and informs good practice. Rangatiratanga and manaakitanga are central to the ethics of a science system that works for people.[84]

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80 Moewaka Barnes, H. (2006), p. 6

81 The marae-based Para Kore programme has a vision for all marae to be working towards zero waste by 2025. http://parakore.maori.nz/para-kore/why-zero-waste/

82 Parkhurst, J. (2017).

83 Parkhurst, J. (2017), p. 8

84 Smith, L. T., Maxwell, T. K., Puke, H., & Temara, P. (2016). Indigenous knowledge, methodology and mayhem: What is the role of methodology in producing Indigenous insights? A discussion from Mātauranga Māori. *Knowledge Cultures*, 4(3), 131–156; Hudson, M. (2004). A Māori perspective on ethical review in (health) research. In *Tikanga rangahau mātauranga tuku iho: Traditional knowledge and research ethics conference 2004* (pp. 54–74). Ngā Pae o te Māramatanga.

Manuhiri welcomed at the International Indigenous Research Conference, Waipapa Marae, 2018.

The benefits and value of Māori science within a policymaking system comes from the manaakitanga that is Māori policymaking – it's caring for Māori communities but also for everyone else. That comes naturally from a Kaupapa Māori policy standpoint. We know the converse is not true when we think about Western policies.

Here it is useful to return to the notion of science advisors as two-way 'knowledge brokers' who facilitate knowledge flows between scientists and policymakers. In this view, communities are the intended beneficiaries of knowledge and policy – they are generally not seen as significant contributors. The notion of scientists providing objective input into policy, while also remaining somewhat detached from it, partly results from the articulation of science and policy as separate spheres with distinct cultures, methods and epistemologies.[85]

In Te Ao Māori, it makes little sense to draw a sharp distinction between science as the creation of knowledge and policy as the enactment of knowledge. Science and policy exist alongside each other and are both backwards and forwards looking. This is a fundamental disconnect that needs to be rectified if the science-policy interface is to reflect Te Tiriti and Mātauranga Māori. As Moana Jackson explains:

The philosophies of our law and political power were also inseparable from the questions we asked about life itself: what is the relationship between people and the power of the land and the universe? Where do the interests of the individual fit within the well-being of the collective? How can the land and its relationships be protected in encounters with those who might have different whakapapa and a different sense of mana and tapu?[86]

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85 Gluckman, P. (2018), p. 93.

86 Jackson, M. (2020). Where to next? Decolonisation and the stories in the land. In B. Elkington, & J. Smeaton (Eds.), *Imagining Decolonisation* (p. 58). Bridget Williams Books.

There are compelling arguments for why communities as knowledge holders and the drivers of locally grounded solutions should be more central to policy formulation and implementation.[87] The pandemic response clearly showed the capabilities within Te Ao Māori.[88] Communities were able to rapidly mobilise their people and resources, synthesising their own accumulated knowledge with pandemic-related information. Many iwi, hapū, and Kaupapa Māori organisations drew on their own infrastructure, information and resources to rapidly assess need, formulate strategy and deploy resources and assistance to those in need. They did this largely without the benefit of Government investment in community data infrastructure – elsewhere, this has been identified as crucial for effective pandemic responsiveness for Indigenous communities.[89] The largely self-determined nature of the pandemic response within Te Ao Māori not only gave expression to mana motuhake and community expertise, but also enhanced the capacity of communities to develop their own forms of resilience.[90] Beyond the context of COVID-19, iwi, hapū and other Māori communities are navigating a range of complex (and often urgent) issues, as are other tauiwi communities. If science-informed policy is to contribute to community solutions, it has to draw from Māori knowledges in far more connected and timely ways.

The opportunity we see is for a much more expansive, vibrant and diverse science-policy interface that includes communities of all kinds, scientists and policymakers. Bringing groups into more direct conversation broadens the sources of expertise and enables communities to more clearly articulate what evidence they need to enact local policymaking. It also provides scientists with opportunities to think more purposefully about the value of their own research, whom it may benefit, and how. Te Tiriti provides an enduring framework within which these levels of engagement can occur.

They want answers now, but I have to say: "Maybe I can give you something in three years' time" after I've put in an application that may or may not be successful. They say, "See you later."

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87 Whyte, K. (2017). Indigenous climate change studies: Indigenizing futures, decolonizing the Anthropocene. *English Language Notes*, 55(1), 153–162. Green, D., & Raygorodetsky, G. (2010). Indigenous knowledge of a changing climate. *Climatic Change*, 100(2), 239–242.

88 McClintock K., & Boulton, A. (In press). *Ko toku ara rā Aotearoa, Our Journey, New Zealand COVID19 2020*. Te Kīwai Rangahau, Te Rau Ora & Whakauae Research Centre. This reports case studies from 9 different rohe of how communities self-determined their responses to COVID-19; McMeeking S., Leahy, H. & Savage, C. (2020). An Indigenous self-determination social movement response to COVID-19. *AlterNative: An International Journal of Indigenous Peoples*, 16(4), 395–398.

89 Carroll, S. R., Akee, R., Chung, P., Cormack, D., Kukutai, T., Lovett, R., Suina, M., & Rowe, R. (2021). Indigenous Peoples' data during COVID-19: From external to internal. *Frontiers in Sociology*, 10.3389/fsoc.2021.617895; Research Data Alliance COVID-19 Indigenous Data Working Group. (2020). Data sharing respecting Indigenous data sovereignty. In RDA COVID-19 Working Group. *Recommendations and guidelines on data sharing*.

90 Spoonley, P., Gluckman, P., Bardsley, A., McIntosh, T., Hunia, R., Johal, S., & Poulton, R. (2020). *He oranga hou: Social cohesion in a post-covid world*. Koi Tū | The Centre for Informed Futures, The University of Auckland.

SECTION 2

TOWARDS A TIRITI-LED SCIENCE-POLICY APPROACH

CONSTITUTIONAL RESPONSIBILITIES UNDER TE TIRITI

This section sets out the Crown's constitutional responsibilities under Te Tiriti and what this means in the context of the science-policy interface. One hundred and eighty years after it was signed, Te Tiriti is now regarded as constitutionally significant. The Courts have upheld Treaty principles that "require Pākehā and Māori Treaty partners to act towards each other reasonably and with the utmost good faith".[91] That duty is not a light one, and "infinitely more" than a mere formality.[92]

There is a growing depth of Treaty jurisprudence that can inform the science-policy nexus.[93] For example, the Waitangi Tribunal's response to stage one of the Wai 1040: Te Paparahi o te Raki inquiry determined that iwi and hapū did not cede sovereignty in signing Te Tiriti.[94] Prior to that, in 2011, Sir Justice Williams (as he is now known) presided over the Waitangi Tribunal's whole-of-government inquiry into the Crown's existing laws and policies affecting flora, fauna, Māori treasures, designs and symbols, carvings and traditional Māori knowledge (Wai 262 claim). The resulting report, *Ko Aotearoa Tenei*, described much of New Zealand's law as being in breach of Te Tiriti principles and concluded that it was "high time to elevate the Treaty interest to its rightful place" alongside other public interests in the relevant legal areas,[95] thereby creating a new approach for "a relationship of equals".[96]

In terms of wide-ranging improvements, the new Public Service Act 2020 (which replaced the State Sector Act 1988), explicitly states that the "role of the public service includes supporting the Crown in its relationships with Māori under the Treaty of Waitangi (Te Tiriti o Waitangi)".[97] In 2019, Cabinet approved a process to develop a Declaration Plan to include time-bound, measurable actions that show how Aotearoa is making a concerted effort towards achieving the United Nations' Declaration on the Rights of Indigenous Peoples.[98] This work signals the Government's serious intent to move Aotearoa towards Te Tiriti and Declaration compliance. Such progress will further stimulate new constitutional possibilities with greater opportunities to enable a relationship of equals. The Government has also signalled an intent to address Wai 262 issues through a work programme that is still in its infancy.[99], [100] This much-anticipated decision is in no small part the result of work by the Tapa Tahi Group,[101] a working group of legal experts that emerged out of the Ngā Taonga Tuku Iho conference of 2018.

Aotearoa New Zealand's science sector should move at pace to now operationalise Te Tiriti – we call for this.

91 New Zealand Māori Council v A-G [1987] 1 NZLR 641 (New Zealand Court of Appeal) ('*SOE case*') 685 (Cooke P).
92 New Zealand Māori Council v A-G [1987] 1 NZLR 641 (New Zealand Court of Appeal) ('*SOE case*') 685 (Cooke P).
93 See Cabinet Office, New Zealand Department of the Prime Minister and Cabinet, Cabinet Manual 2017; Ruru, J. (2016). Constitutional indigenous treaty jurisprudence in Aotearoa, New Zealand. In P. Macklem and D. Sanderson (Eds.), *From recognition to reconciliation. Essays on the constitutional entrenchment of Aboriginal and treaty rights* (pp. 425–58). University of Toronto Press.
94 Waitangi Tribunal. (2014). *He Whakaputanga me Te Tiriti: The Declaration and the Treaty. Report on stage 1 of the Te Paparahi o Te Raki Inquiry* (Wai 1040).
95 Waitangi Tribunal. (2011), p. 246.
96 Waitangi Tribunal. (2011), p. 248.
97 Public Service Act 2020, clause 14.
98 Te Puni Kōkiri. (n.d.). *UN Declaration on the Rights of Indigenous Peoples.*
99 New Zealand Intellectual Property Office. (2019). *Whole-of-government work programme announced for Wai 262.*
100 To date there has been little response to issues concerning the protection of taonga species and rongoā. In health, for example, there has yet to be recognition of rongoā in terms of equitable funding, contracting, monitoring and accountability arrangements and workforce investment.
101 Te tauihu nga taonga tuku iho communique (2019).

Agency commitments to upholding Te Tiriti will need to move beyond symbolic gestures.

PARTNERED AND AUTONOMOUS APPROACHES

Māori have repeatedly shared aspirations for how Aotearoa can give effect to Te Tiriti. One important example is the work encapsulated in the Matike Mai report. In 2010, Māori nation state leaders established a Māori working group to engage in hundreds of meetings with Māori across the country to consider possible constitutional reform. Their report, Matike Mai Aotearoa (2016), presents six structural constitutional transformation models as possible options for enabling "different spheres of influence". Several of the models are particularly well suited for adaptation to a Tiriti–led science-policy approach. In them, Māori are able to express tino rangatiratanga vis-à-vis autonomous Māori decision-making in one sphere (the rangatiratanga sphere) while the Crown makes decisions in a second sphere (the kāwanatanga sphere). Both partners "work together as equals" in a relational sphere.[102]

While Crown agencies are increasingly comfortable with the notion of partnership in a relational sphere, their understanding of and capability to engage with rangatiratanga is largely untested. Yet, for Māori, the space for self-determined development is critical. As Matike Mai points out, giving effect to the practice of tino rangatiratanga sovereignty in all contexts is an inherent component of Te Tiriti. This is germane to the science-policy nexus, but also has broader implications for Mātauranga Māori, Māori intellectual property rights and Māori data sovereignty.[103]

In order for the intent of Te Tiriti to be brought into the science-policy interface – and the RSI system more broadly – changes at the systems level are needed. Committed and influential individuals working in this area are necessary but insufficient to create the sustained change needed for transformational, positive outcomes. Enabling both self-determining and co-determining models through innovative mechanisms will allow for a more authentic, engaged and productive set of relationships. This may require legislative change.[104]

A number of government departments are now making visible their commitments to Te Tiriti through policies, plans and strategies, some of which are listed in Table 1. The emphasis is on partnership in the context of existing government structures. We note that government agencies in Aotearoa, and internationally, have a history of what Ahmed calls "nonperformativity" when it comes to diversity, anti-racism and other progressive social agendas.[105] The legislative changes outlined earlier means agency commitments to upholding Te Tiriti will need to move beyond symbolic gestures to operationalise responsibilities in meaningful, transparent and tangible ways.

102 Matike Mai Aotearoa. (2016). *He whakaaro here whakaumu mō Aotearoa. The Report of Matike Mai Aotearoa—The Independent Working Group on Constitutional Transformation.* University of Auckland. See also, Vasudevan, A. (2017). Restoring rangatiratanga: Theoretical arguments for constitutional transformation. *Auckland University Law Review*, 23, 9–118.

103 See, for example, the Charter and Māori Data Sovereignty principles of Te Mana Raraunga | Māori Data Sovereignty Network at https://www.temanararaunga.maori.nz/.

104 For example, the Research, Science and Technology Act 2010 and Royal Society of New Zealand Act 1997.

105 Ahmed, S. (2016). How not to do things with words. *Wagadu: A Journal of Transnational Women's and Gender Studies*, 16, 1–8; Ahmed, S. (2006). The nonperformativity of antiracism. *Meridians*, 7(1), 104–126.

Table 1: Te Tiriti commitments in/or relating to public service

Ministry/Department	Policy/Initiative	Tiriti Focus
Ministry of Health	Whakamaua Māori Health Action Plan 2020–2025 Te Tiriti o Waitangi Framework	Whakamaua Māori Health is the implementation plan for He Korowai Oranga, New Zealand's Māori Health Strategy. It sets the Government's direction for Māori health advancement over the next five years. Whakamaua is underpinned by the Ministry's new Te Tiriti o Waitangi Framework, which provides a tool for the health and disability system to fulfil its stewardship obligations and special relationship between Māori and the Crown.
Health Research Council of New Zealand, Ministry of Health, Ministry of Business, Innovation and Employment	The New Zealand Health Research Prioritisation Framework	Ensuring health research undertaken in New Zealand is conducted appropriately for the New Zealand context and meets the spirit, obligations, and opportunities of our founding document – Te Tiriti o Waitangi.
Ministry for Environment	Manu Taiao team	To develop, improve and monitor the relationship between the Ministry and Māori in order to deliver effective legislation, regulation and policy that meets the MfE's obligations to Māori as a Treaty partner.
Department of Conservation	Conservation General Policy Conservation and Environment Science Roadmap	Effective partnerships with tangata whenua to achieve enhanced conservation of natural resources and historical and cultural heritage.
Ministry of Education	Ka Hikitia – Ka Hāpaitia. Māori education strategy The Education and Training Act 2020	Te Tiriti as a guiding principle to give it practical effect in the education system. To address education agencies' obligations under Te Tiriti o Waitangi, section 6 of the Act allows the Ministers of Education and Te Arawhiti, after consultation with Māori, to issue a statement specifying what education agencies must do to give effect to the public service objectives expectations that relate to Te Tiriti o Waitangi. The intention of the statement is to provide greater specificity around what those education agencies must do to be Tiriti compliant.
Stats NZ	Mana Ōrite Relationship Agreement[106]	Agreement between Stats NZ and the Data Iwi Leadership Group of the Iwi Chairs Forum. The purpose is to work together, as Treaty partners, to realise the potential of data to make a sustainable, positive difference to outcomes for iwi, hapū and whānau. It explicitly recognises that both parties have equal explanatory power and accept each other's perspectives, knowledge systems and world views as being equally valid.
Ministry of Foreign Affairs and Trade	Te Taumata	A key partner for dialogue with the New Zealand Government on trade-related issues. Champions Te Tiriti o Waitangi and its principles into all trade negotiations between Aotearoa and the rest of the world.
Environmental Protection Authority (EPA)	He Whetu Mārama Ngā Kaihautu Tikanga Taiao | Māori Advisory Committee Kaupapa Kura Taiao – Māori Policy Unit	A framework that guides the EPA in undertaking its statutory and other obligations to Māori. It is guided by four principles of Te Tiriti o Waitangi. Statutory committee appointed by the Board provides advice to the EPA to ensure Māori perspectives are taken into account. Aims to ensure Māori perspectives including Te Tiriti o Waitangi are incorporated internally and externally within the EPA's work.

True partnership must be founded on power sharing in a relationship of equals.

PARTNERSHIP IN THE RELATIONAL SPACE

True partnership must be founded on power sharing in a relationship of equals. Acknowledging and incorporating Mātauranga Mātori into evidence and decision-making is, on its own, insufficient. Article 2 of Te Tiriti guarantees that Māori should have critical decision-making capacity and leadership throughout the public and private sectors and have significant international reach. Many Māori academics and policy advisors have had the lonely experience of being the only Māori on boards, panels and advisories within the science-policy system. In these inequitable arrangements, it is difficult – indeed impossible – to gain the leverage needed to effect real change for Māori, and to drive Aoteaora to be better and bolder. In the relational space, co-design and co-determination as Te Tiriti partners offers much greater possibilities for mutually defined success.[107]

The issue of structural reform means investing in Māori leadership and resources for Māori. It's not just about putting one or two Māori in positions.

Enabling and resourcing Māori-centric modes of leadership is important. Distributed leadership offers different kinds of knowledges that may be content- or place-based, and collectively formed and held. Ngā Pae o te Māramatanga provides a model where disciplinary knowledge, Mātauranga Māori and the application of a broad range of methodologies produces research that is oriented towards positive transformation.[108] Though obvious, it is important to note that the rights and responsibilities guaranteed by Te Tiriti are not only for Māori but also for tauiwi. In this light, the onus is on tauiwi working at the science-policy interface to upskill themselves on what it takes to be a good Te Tiriti partner, and to examine their own practices and accountabilities in the system. Continuing to ignore repeated instances of advice from Māori is an untenable and unconstitutional position.

... the fundamental challenge is for policy makers and those who enact those policies to recognise and examine the assumptions, concepts and norms within which they operate.[109]

Protecting and transmitting Mātauranga Māori is a responsibility shared between Māori and the Crown: neither party can succeed with their Te Tiriti commitments without the help of the other. While there are reasonable limits on the Crown's obligation, and the need to balance Māori and other legitimate interests on a case-by-case basis, there is nonetheless a clear necessity for the Crown and Māori to work in partnership.

106 https://www.stats.govt.nz/about-us/what-we-do/mana-orite-relationship-agreement/
107 Spoonley, P., Gluckman, P., Bardsley, A., McIntosh, T., Hunia, R., Johal, S., & Poulton, R. (2020). He oranga hou: Social cohesion in a post-COVID world. Poulton, R., Gluckman, P., Menzies, R., Bardsley, A., McIntosh, T., & Faleafa, M. (2020). Protecting and promoting mental wellbeing: Beyond Covid-19.
108 Ruru., J., Nikora., L. W., McIntosh., T., Kukutai., T., Patrick., D. (2019).
109 Moewaka Barnes., H. (2006), p. 9.

The Wai 262 report discussion on research, science and technology recommended the establishment of viable partnership models between Māori and the Crown in the retention and transmission of Mātauranga Māori. The report set out principles of these working relationships that include Crown coordination, appropriate prioritisation, sufficient resourcing and shared objective-setting with Māori.[110]

POTENTIAL BENEFITS OF PARTNERSHIP IN THE RELATIONAL SPACE

Clearly it is mutually beneficial to find a way for Māori and the Crown to work in partnership in science-policymaking and to provide the optimal policy settings for this to occur. Specific benefits would include:

- expanding what is legitimised as knowledge, and therefore, what can be considered during policy development
- clearer understanding by government policymakers of the Crown's Te Tiriti responsibilities to Te Ao Māori within the RSI sector, potentially through establishing a forum for direct dialogue between Te Tiriti partners
- greater numbers of skilled Māori in influential roles across the RSI sector and at the science-policy interface can help build communities of practice
- closer relationships and authentic partnerships between scientists and policymakers, countering the quickfire research that consultants are often commissioned to do for policy development and the often-absent Māori lived experience
- clearer distinction between Crown-governed science sector activities, Crown-supported science sector activities and private science activity as they relate to Te Ao Māori in Te Tiriti partnership
- areas and order of priorities for the Crown to meet its Te Tiriti responsibilities in the science sector can be agreed upon in partnership
- better policy settings for equitable access to science sector resource and participation for Māori
- methodological innovation including the formulation of standards and metrics that reflect the interests of both Te Tiriti partners
- developing knowledge translators, at scale, that can understand and communicate from a distinctive dual-knowledge base.

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110 Waitangi Tribunal. (2011).

The power to set this agenda… requires an independently resourced and unapologetically Māori space.

THE RANGATIRATANGA SPACE

While creating a relational space where more effective policy can be co-developed by Māori and tauiwi may improve the status quo, deploying approaches that support autonomous science activity may lead to greater success. Article 2 of Te Tiriti guarantees the right for Māori to maintain rangatiratanga over Māori knowledge, resources and taonga. Protection of these rights through legislation,[111] such as intellectual property rights, is the Crown's responsibility.

Growing the Mātauranga Māori continuum and advancing Kaupapa Māori research in our own way is a task that is best carried out either without direct Crown involvement (as an independent activity) or supported, but not governed, by the Crown. The power to set this agenda, to implement it, to benefit from it and to evaluate its outcomes requires an independently resourced and unapologetically Māori space.

Being around the table in a partnership model on the mana of the Crown is not really tino rangatiratanga. We want them to lift out the resources and let us govern ourselves … and then a Māori lens can be applied to how funding like that can be valued: from its practitioners, from its measure as impact, from what is actually measured, and how it is measured.

Science in the rangatiratanga space would need to be properly resourced to enable the development and deployment of science initiatives directly to Māori, where the processes of Māori science methodologies align more directly with the mobilisation of Mātauranga Māori.

111 For example, the Wildlife Act 1953 and the Native Plants Protection Act 1934 provide for Crown ownership of flora and fauna which has the potential to impinge on Māori customary use of native plants and animals.

Launch of *Ngā kete mātauranga: Māori scholars at the research interface*, **Te Papa, March 2021. Credit: Big Mark & Co.**

POTENTIAL BENEFITS IN THE RANGATIRATANGA SPACE

- empowerment of internationally distinctive knowledge base (Mātauranga Māori) to stimulate inclusive and sustainable growth and innovation
- Te Ao Māori settings that break down imagined borders between science, policy and communities, and provide space for free and frank dialogue to occur
- Te Ao Māori settings that create capacity and capability are unlikely to reproduce and reinforce the current status quo and arrangements that marginalise Mātauranga Māori and pūkenga
- a dedicated Māori space removes the impediment of low trust which impedes information and power sharing
- closer alignment between generation of appropriate evidence and meeting community priorities and needs
- supports research leadership in communities
- supports the maintenance and enhancement of Māori-centric cultural and scientific enterprise and sustainable future-focused research agenda.

SECTION 3

RECOMMENDATIONS

Systemic solutions are needed for systemic problems

A Tiriti-led science-policy approach provides a framework that supports the dual threads of Māori and the Crown working both together and autonomously. Such a system would enable us all to respond to key challenges facing Māori communities, Aotearoa and the world.

Part of the rationale for this paper is to expose the long-term negligence of the Crown: for not providing clear reasons for making decisions on science policy and investment, and for not evaluating the Vision Mātauranga policy over the 15 years it has been in place. Underpinning this is a failure to measure and map the Māori science sector.[112] Neither Māori nor funders are currently able to identify how, where or to whom investment in Māori research is allocated, nor what transformational impacts are being derived. This lack of understanding makes it impossible to evaluate processes, or to understand what works well and where the potential for improvements lies. With hundreds of millions of dollars of funding at stake, quantifying outcomes is vital.

Te Tiriti provides for the articulation of key principles to guide the formation of power around resources. For example, Article 2 of Te Tiriti requires that Māori are empowered to develop and safeguard Māori knowledge. In terms of the RSI system, this might relate to Kaupapa Māori science and research being elevated to equal status with Western science across the country's research organisations. Article 3 of Te Tiriti means Māori must have access to resources to support levelling across the science system. One important resource is funding, so funding agencies should ensure policies are in place to allocate budgets for Māori-led research. These funding models should be based on Te Tiriti principles, rather than population proportionality within the broader workforce.[113]

With these points front of mind, Table 2 below sets out five priority recommendations that may be realised through a range of actions that could be progressed in the next one to five years. Now is the time to capitalise on the work already carried out by the Waitangi Tribunal, Ngā Pae o te Māramatanga, Rauika Māngai and myriad others to guide Aotearoa towards the kind of future originally envisioned in Te Tiriti.

We look forward to taking this journey together.

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112 Rauika Māngai. (2020).

113 A restorative justice approach to resource allocation, for example, would recognise that recovering from almost 200-years of discrimination will require significant resource and that a rebalancing is needed to compensate for the overfunding of Western science during that time.

Table 2: Five priority recommendations

Short Term (1–2 years)
Develop Tiriti-based guidelines for RSI funding. These guidelines should support funding agencies to understand and meet their Tiriti obligations and opportunities with respect to their investments in RSI.
Appoint Māori Chief Science Advisors in key government departments. Start with departments that have a demonstrated commitment to Te Tiriti and strong relationships with iwi and Māori organisations and communities. The Māori CSAs should be resourced to connect and extend cross-agency Māori science leadership capacity.
Strengthen monitoring of Māori RSI investment and activity. Co-determine a cross-government approach to guide departments on how they can transparently evaluate, measure and report on how their investments contribute to positive Māori outcomes. There should be a clear pathway for increased investment in Māori-led RSI.
Medium Term (3–5 years)
Establish Mātauranga Māori Commission/Entity. The Commission would sit outside the public service, with autonomous governance and baseline funding. It would provide leadership over Mātauranga Māori including Māori knowledge priorities that extend beyond the RSI sector.
Develop a plan for regionally based Te Ao Māori policy hubs. These hubs would identify iwi, hapū and community policy priorities and needs, and provide Māori thought leadership for medium- and long-term strategic development that extends beyond election terms. The Māori CSAs would be key connectors between the hub, Māori researchers, community-based pūkenga (experts), and policymakers.

Pūhoro STEM Academy. Credit: Pūhoro STEM Academy.

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How to reference this report:

Kukutai, T., McIntosh, T., Boulton, A., Durie, M., Foster, M., Hutchings, J., Mark-Shadbolt, M., Moewaka Barnes, H., Moko-Mead, T., Paine, S-J., Pitama, S. & Ruru, J. (2021). Te Pūtahitanga: A Tiriti-led science-policy approach for Aotearoa New Zealand. Auckland: Ngā Pae o te Māramatanga.

ISBN 978-0-473-57158-0 (softcover)
ISBN 978-0-473-57159-7 (pdf)