

SPEAKER'S SCIENCE FORUM

Hosted by Jamie Strange MP

Alternative forms of governance for Te Taiao



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Manuhiri Invited guests

Dr George Slim

Consultant, Office of the Prime Minister's Chief Science Advisor

Phoebe Fordyce

Te Tira Whakamātaki

Tania Gerrard (Te Whanau a Tāpuhi, Ngāti Porou)

GM, Māori Strategy and Partnerships at GNS Science

Holden Hohaia (Ngāti Maru/Taranaki Whānui ki te Upoko o te Ika)

GM, Māori Partnerships at Manaaki Whenua - Landcare Research

Helen Lomax

Director, Ako Aotearoa



Ngā Kaikōrero Presenters

Melanie Mark-Shadbolt

Te Tira Whakamātaki

Dr Shaun Awatere

Manaaki Whenua - Landcare Research



The triple threat of disaster, disease and climate change - why we need alternative forms of environmental governance

Dr Shaun Awatere, Manaaki Whenua Landcare Research
Melanie Mark-Shadbolt, Co-Founder & Trustee, Te Tira Whakamātaki



Tēnā koutou, tēnā koutou, tēnā tatou katoa
Tēnā koutou kua huihui mai nei
E mihi ana ki ngā rangatira katoa
Ko tenei taku mihi ki ngā tāngata whenua o enei rohe – Te Atiawa tēnā koe
Ko Tararua ngā paemaunga
Ko Ruamāhanga toku awa
Ko Takitimu te waka
Ko Ngāti Kahungunu ki Wairarapa te hapū
Ko Papawai te marae
Ko Ngāti Kahungunu rātou ko Ngāti Porou, Te Arawa, Te Atiawa, Ngāti Raukawa, Ngāti
Tuwharetoa, Rangitane, Whakatohea oku iwi.
Ko Melanie Mark-Shadbolt ahau

Kia ora koutou, I'm Mel a co-founder and Trustee of Te Tira Whakamātaki a Māori environmental not-for-profit and home of the Māori Biosecurity Network. I'm an indigenous environmental sociologist who has been on a journey of learning about public policy the last three years while I work part-time at the Ministry for the Environment.



Today Shaun and I want to talk about the very real need for alternative forms of environmental governance and management, especially if we want to address the triple threats of disasters, disease, and climate change, as well as the enormous social cohesion and security problems central to the growing issues around environmental degradation.

I will start by laying out the very real threats we are facing and the complex interconnectedness of those threats, before issuing the challenge of creating new solutions that are holistic and inclusive, and grounded in indigenous perspectives and community aspirations.

Shaun will then share how mātauranga and te Tiriti are already guiding environmental policy and governance, and how science and indigenous knowledge work together to find solutions and why we need that to continue.

I will then wrap up with some brief comments on why we need to promote adaptation that empowers communities to be decision-makers in how they preserve, conserve, and sustainably use or develop their natural resources.

Ecosystems are the foundation for human life. They perform a range of functions, often referred to as, among other things, ecosystem services. Without these free services human societies and economies would not operate at their current level.



We depend on the services nature provides for air, water, food and fibre, shelter and energy.



Equally many of our most significant memories – our joy, heartache, love, inspiration,



and reassurance is linked to nature. We are as dependent on nature for our very existence.

Ecosystems can tolerate a measure of impact from human use and recover after a period of time with minimal negative effects – an attribute generally known as



resilience – but beyond a certain threshold, or “tipping point”, sudden and radical disruption occurs, which may lead to “ecosystem collapse”.



Under such conditions, soil quality, freshwater supplies and biodiversity diminish drastically, while agricultural capacity plummets and daily human living conditions deteriorate significantly.

New and growing evidence on “ecosystem collapse” suggests it is largely due to among other factors, human pressure, and climate impact, and it’s estimated that one-fifth of the world’s countries are at risk of their ecosystems collapsing because of the destruction of wildlife and their habitats.

Here in Aotearoa New Zealand two-thirds of our rare ecosystems are under threat of collapse, and from what we can see it’s been getting worse. In fact there is evidence to suggest New Zealand is losing species and ecosystems faster than nearly any other country.



Ecological collapse across the globe has seen dramatic social and economic consequences for the local communities who rely on those resources. Ecological changes not only destroy livelihoods but can lead to severe health and economic impacts, and can generate resource-based conflicts.

When more than half the global GDP depends on high-functioning biodiversity, and when natural services such as food, clean water and air, and flood protection have already been damaged by human activity, the risks of hitting tipping points grows. We know now that the decline in biodiversity and related beneficial services is dire.



And in today's world with increasing populations and more demand on local ecological systems for the resources they provide - it is the amplification of climate change impacts that are drastically compromising the planet's capacity to sustainably support a large and growing human population because we no longer give the environment the time it needs to effectively recover.



Almost 30 years ago, politicians and tens of thousands of eco-warriors gathered in Brazil for the Earth Summit. Government leaders from 168 countries signed up to the Convention on Biological Diversity, promising to address the decline of the Earth's living systems.

In 2010 leaders agreed to 20 targets – known as the Aichi targets - which they hoped would see a 2020 world in which “pressures on biodiversity are reduced, and ecosystems are restored”.

In 2019 leading scientists warned that humans were in jeopardy from the accelerating decline of the Earth's natural life-support systems.

In 2020 the UN revealed that the world's governments had failed to meet a single target to stem biodiversity losses in the previous decade.

That same year a WWF report revealed populations of mammals, birds, amphibians, reptiles and fish fell by more than two-thirds in the last five decades and warned “our planet is flashing red warning signs of vital natural systems failure”



Also in 2020 IP-BES - the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services - released a report highlighting the clear links between global health pandemics and the biodiversity and climate crisis. Noting specifically that changes in land use, the expansion and intensification of agriculture and the trade and consumption of wildlife, disrupt ecosystems, promote proximity between humans and wildlife, livestock and humans and thus with the pathogens they carry.



This year the global assessment report on disaster risk reduction noted that despite commitments to build resilience, tackle climate change and create sustainable development pathways, current societal, political, and economic choices were doing the reverse.

Finally, there have been numerous reports, including one from the Obama administration, that highlight the changing security risks that climate change and biodiversity loss are creating. Most agree that national security implications of climate change impacts are far reaching, and they may exacerbate existing stressors, contributing to poverty, environmental degradation, and political instability, thus providing enabling environments for terrorist activity across the globe.

These reports note that people have fought over land, water, and resources many times in the past. That resource scarcity – whether energy, water or arable land can have profound effects on food security, and could, mostly likely will, lead to a breakdown in established codes of conduct, and rules-based order posing threats to overall stability. Equally the impacts of flooding, disease and famine will lead to increased migration, most likely into areas of already high tension where resources are already stretched to the limit.



Collectively these reports, and others, warn not only that human activity, in combination with other factors, is creating the biodiversity crisis putting at least one million plant and animal species at risk of extinction around the world. But that it is also causing climate change, and that climate change influences certain natural disasters and increases the risk of other threats like pandemics and social disorder.

Future pandemics will emerge more often, spread more rapidly, do more damage to the world economy, and kill more people than COVID-19 unless there is a deep reassessment and transformation of the relationship between humans and nature, and of the unsustainable consumption practices leading to biodiversity loss, climate change and the emergence of pandemics.



As leaders of our country, who've made policy, and debated policy during the COVID pandemic, you are all aware that social cohesion is fragile and breaks down easily under pressure like that created by pandemics.

A UN report last year noted that the secondary impacts of the pandemic would likely push tens of millions into extreme poverty, cause commodity prices to rise, and threaten livelihoods. You've all seen that happen, even before the Ukraine invasion. That report also noted that we were seeing across the globe rising authoritarianism, democratic backsliding and ethno-nationalism and increasing civil unrest via protests. The pandemic has brought to the surface deeply rooted inequalities and noted the fragility in our governance systems.



Now more than ever we need new solutions, that are holistic in nature, founded on interconnectedness, respect of and reconnect of people to nature, that are inclusive and future focused.

Kind of sounds like indigenous science to me – you know knowledge gained by observing and interpreting changing environments, noting, and recording valuable insights about that environment. Knowledge that doesn't differentiate by discipline is holistic and interconnected, that places people in nature, and knowledge that is inclusive and intergenerational. That knowledge system, in our case mātauranga Māori, compliments scientific data with chronological and landscape-specific detail that is critical for verifying environmental theories including climate change scenarios.

That type of knowledge system, a truly indigenous one, is flexible and has been proven to contribute to community resilience by supporting cultural and social cohesion, collective leadership, and social justice. It openly accepts and favours home-grown philosophies and approaches over national or global ones and looks to cut through barriers like those created by ridged institutions and agencies with vested interests.

So now that I've depressed you all by talking about the very big environmental crises were facing I'm hoping my segue into the very need for indigenous approaches sets Shaun up nicely to give us some real life examples of indigenous approaches to managing our taiao.



Shaun starts from here: We have been doing research for the Sustainable Seas NSC which confronts the question of “why are we always arguing about risk and uncertainty to the natural environment and how can co-governance help shape a better future for our taiao?”

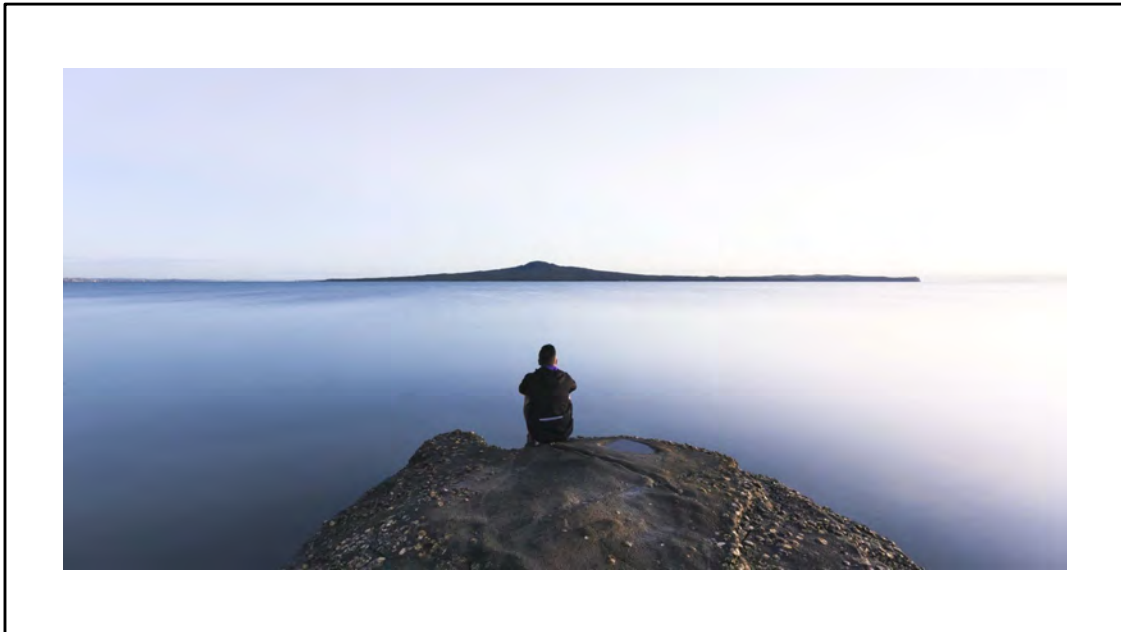
From the literature and our research, we can point to three ‘big’ concepts or influences that suggest that others think differently. The influences are:

- personal positioning,
- academic disciplines and professional bodies and
- a background of worldviews

Personal positioning: In decision making about competing resource uses, decision-makers often occupy multiple positions about the matter at hand. Some may be a board director while others might be kaimahi

People have been taught different ways to approach ‘truth’ and ‘knowing’, and power relations. This has huge impact on their ability and capability in the processes of enacting co-governance.

Disciplines: explorations of disciplines revealed widely differing interpretive conventions on RnU. A lawyer’s perspective of risk can be vastly different from that of a psychologist. This meant different starting positions had to be acknowledged when addressing natural resource management.



Worldviews: the main worldviews in the Aotearoa New Zealand context are:

- The Dominant Social Paradigm (DSP) that contends a Bountiful world for resource extraction
 - predominately informed by the disciplines of economics and law
 - Is about loss, change, and cost-benefit analysis
 - Is embedded in societal structures, legislation, governance and industry
 - It hinders change towards futures based on alternative governance approaches for te taiao.
- The New Ecological Paradigm (NEP) views Nature as a limited resource, and favours
 - Non-materialism, participatory structures & safety
 - Trusts democracy rather than experts
 - Views te taiao as a delicately balanced limited resource
 - Encapsulated in the approach of EBM – involves managing the environment in a holistic and inclusive way. This means that competing uses are managed in a way that does not degrade the environment for future generations.
- Te Ao Māori (TAM) worldview that is a relational environmental approach
 - Conceptualises social relations in ecology rather than separately
 - Individual and community behaviour regulated by concepts of mana (power, intrinsic value), tapu (sacredness) and mauri (lifeforce)
 - Institutions based on core principles like kaitiakitanga (intergenerational sustainability), whakapapa (connectedness) and manaakitanga (reciprocity) influence decision making for social and spiritual outcomes for future generations
 - Priority given to delivery of outcomes of mutual benefit for kin groups and ecosystems
 - Extracting resources should be done in a manner that builds Intergenerational benefits



- Side note – Mātauranga Māori is increasingly informing science policy and natural resource management approaches in Aotearoa-NZ so what is mātauranga Māori?
- Mātauranga Māori is not bio-cultural knowledge nor is it traditional ecological knowledge.
- Mātauranga Māori is intertwined with people, their history, culture, and ecosystems. It is dynamic, and changes as ecological pressures influence its development.
- Mātauranga Māori includes belief systems, epistemologies, values, bio-physical science, astronomical science and knowledge both in a traditional and contemporary sense. As with western knowledge, in terms of epistemology mātauranga Māori has both qualitative and quantitative aspects. Mātauranga Māori can be defined as the knowledge, comprehension or understanding of everything visible and invisible existing in the universe.

NOTE: Te Parapara Maori garden in Hamilton Gardens, New Zealand. New Zealand's only traditional Maori productive garden, showcases traditional Maori cultivation knowledge



Whilst risk and uncertainty in environmental management is commonly considered in the context of how to reduce the potential impact of an activity, Māori have a different worldview perspective, thinking instead of how an activity can “enhance the mana” of a natural resource in the first instance (rather than being limited to reducing adverse risk)”



Worldviews crucially affect how rights are perceived, and what risks may be taken with the balance of rights. Dominant worldviews have the most influence on how rights are distributed, e.g. private property wins in economic growth model. Shifting the balance of rights means looking at the worldviews



From this research, we tentatively surmise that *the way we have traditionally come to know or not know risk with respect to the environment is compounding the difficulties of stepping towards co-learning, co-production and co-governance.*



Learning how to co-govern is fundamentally shaping relations and practices



Acknowledging that we are different from any other country in our particularities is important. Different kinds of matters count here; in part because multiple worldviews are beginning to be recognized and situated in place.



This helps us collectively reimagine decision-making and pose questions such as:



What if economy wasn't first, but investment was driven by achieving a balance between societal needs and environmental wellbeing or



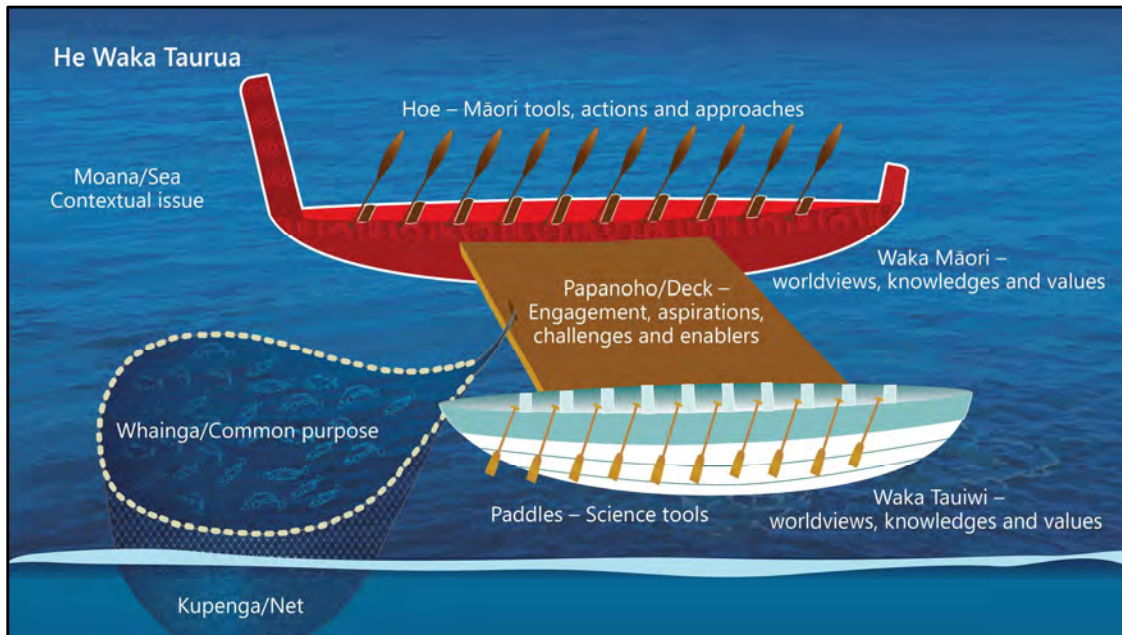
what if enhancing the mana of te taiao informed our priorities?



The dichotomy of environment versus economy needs to be shaken. Instead of being in opposition, they are all part of complex systems.

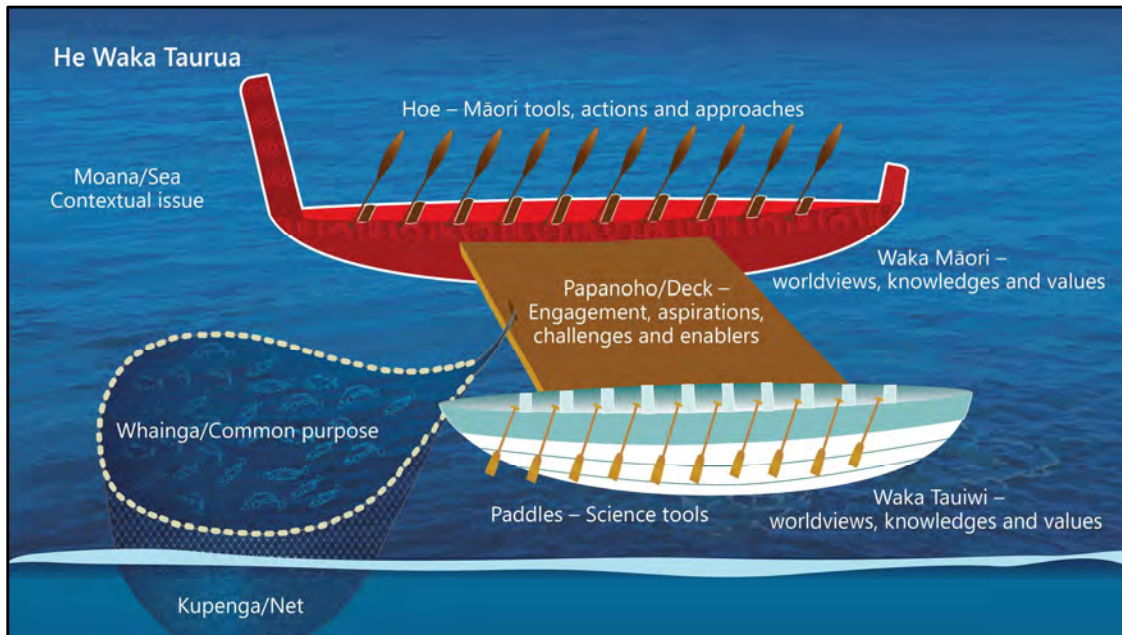


The wider set of cultural influences at work in Aotearoa, means that as well as the staunchly individualistic and profit privileging DSP, there are models of the world that expose the need to develop collective capacities and account for intergenerational transfer of risk. Acknowledging and working with multiple worldviews offers a chance to shift from a focus solely on the individual to a more nuanced and complex approach.

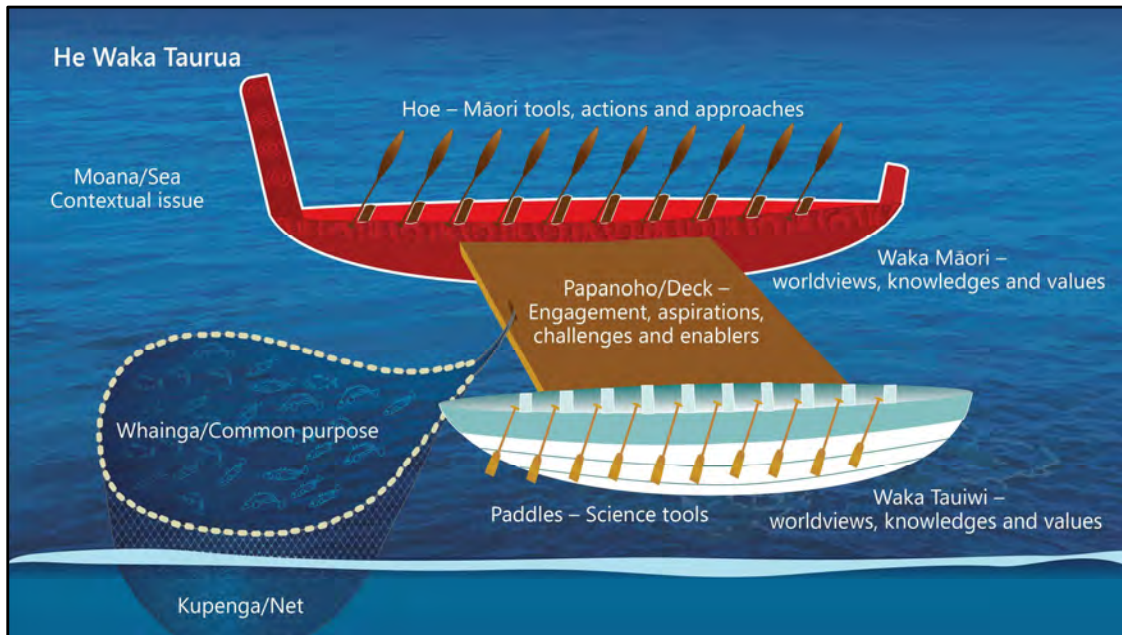


He Waka Taurua

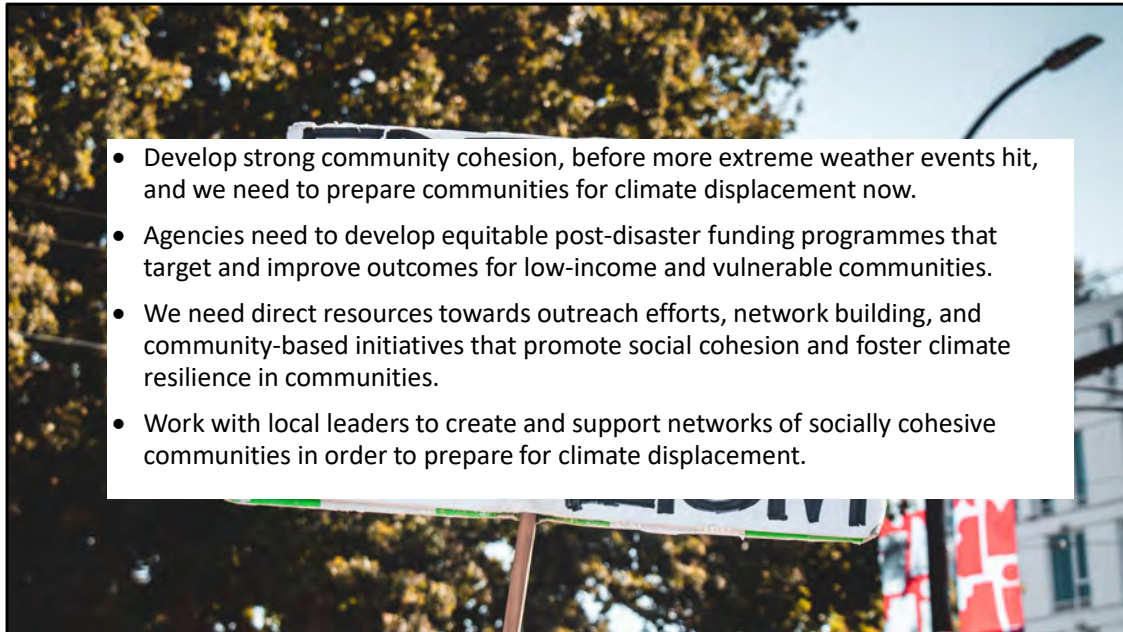
- So how can we work with multiple worldviews to shift towards a collection vision for te taiao:
- As part of the Sustainable Seas NSC, we developed a framework for co-governance, the Waka-Taurua framework that is informed by an Aotearoa experience of co-governance and co-management (see for example Seachange – Tai Timu Tai Pari (2017) and the Integrated Kaipara Harbour Management Group or Kaipara Remediation Group (2011)).
- Sidenote: The framework has recently been implemented into the strategy for Manaaki Whenua Landcare Research, We conduct science and research focused on environmental issues, opportunities, and solutions, and through partnering with users we aim to create value for Aotearoa
- The primary components of the framework include: the whaingā (common purpose) is represented by the kupenga (net), the common purpose brings the two groups together for example co-governance of a harbour; the two groups and their respective worldviews and values, both transcendental (meta-physical) and contextual values (eg taonga species, fishing grounds, wāhi tapu), are represented by the hiwi (hulls) of each waka, the waka Māori (left vessel) and waka Tauwi (right vessel); the hoe (paddles) of each Waka represent the tools, approaches and actions, derived from the respective waka eg, māramataka (which is the Mātauranga Māori praxis between astronomy, lunar science and ecology), other tools include economic evaluation or participatory planning; the moana (or sea) represents any contextual issues or threats that are discussed;
- Between the two waka is a papa noho (deck) connecting together the two parties as a place for engagement to identify a joint approach to achieving the whaingā (common purpose). The papa noho is also the space where we negotiate or reconcile shared values from each worldview and grow our shared understanding.



- The successful implementation of a co-governance framework like He Waka Taurua, to support healthy ecosystems, faces several challenges.
- The context specificity of shared values means that reconciling worldviews will be problematic. In NZ, identification of Māori transcendental/ethical values is relatively straight forward and have been documented within planning documents for marine environments (see for example Seachange – Tai Timu Tai Pari (2017); and the Integrated Kaipara Harbour Management Group (2011)).
- However, translating the implications of these transcendental values into policy is not so straight forward. Co-governance needs to be able to respond and adapt through a negotiated space, the papa noho from the Waka Taurua framework, to ensure that indigenous values are adequately considered in planning documents. Concurrently some indigenous values are not tradeable and include transcendental values, ethics or principles like kaitiakitanga the intergenerational ethic of sustainability.
- New Zealand has a generally robust regulatory process for environmental regulation of natural resources that includes the recognition and protection of Māori interests. There is evidence of extensive ‘flax-roots’ level collaboration and power-sharing with kaitiaki in the Kaipara and Tikapa Moana -Hauraki. However, A lack of capacity on the part of kaitiaki to participate in planning processes places further limitations on implementing co-governance. Therefore, participation by kaitiaki in co-governance needs to be adequately resourced otherwise the Waka Taurua may capsize.



- Despite these challenges, it has become increasingly accepted that multiple worldviews play a role in natural resource management in Aotearoa. Understanding worldviews is fundamental for the successful implementation of co-governance within Aotearoa, particularly within institutional arrangements that encourage collective decision-making and power sharing. The context specificity of shared values means that implementation of a universalistic set of policies, rules and methods will be problematic. Instead, application of value elicitation methods that embrace spatial specificity alongside qualitative data is therefore prudent.
- He Waka Taurua provides an equitable solution moving forward with co-governance and Comanagement in Aotearoa, as it represents the worldviews, values and even knowledge systems of each party as valid in its own right, and provides a process for how diverse worldviews can function independently but come together as a Waka Taurua for achieving a common purpose that is unlikely to be achieved by one waka alone. He Waka Taurua serves as a guide for understanding what information needs to be included in a joint decision-making approach for groups wishing to appropriately embark on these types ventures such as the co-governance of Aotearoa's natural resources.



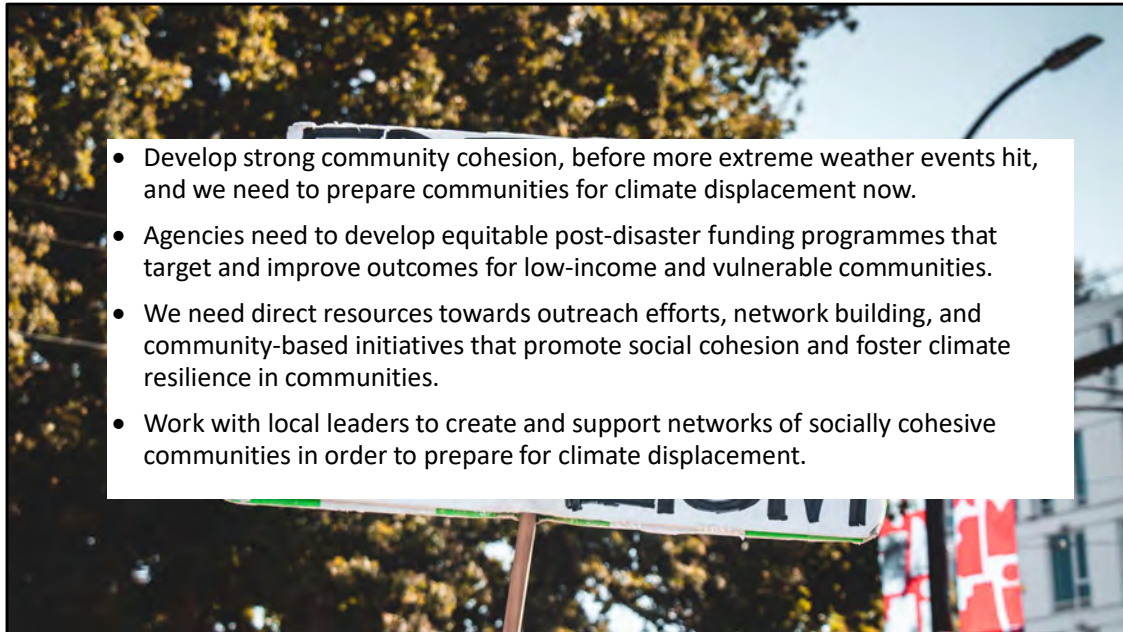
- Develop strong community cohesion, before more extreme weather events hit, and we need to prepare communities for climate displacement now.
- Agencies need to develop equitable post-disaster funding programmes that target and improve outcomes for low-income and vulnerable communities.
- We need direct resources towards outreach efforts, network building, and community-based initiatives that promote social cohesion and foster climate resilience in communities.
- Work with local leaders to create and support networks of socially cohesive communities in order to prepare for climate displacement.

Mel restarts here: As Shaun reminds us that throughout history, Indigenous peoples have been responsible for the development of many technologies and have substantially contributed to science. And while Science is the pursuit of knowledge. Indigenous science incorporates both traditional knowledge and Indigenous perspectives which are holistic and founded on interconnectedness, reciprocity, and respect for nature.

In closing I wanted to note, why I think we need to promote adaptation that empowers communities to be decision-makers.

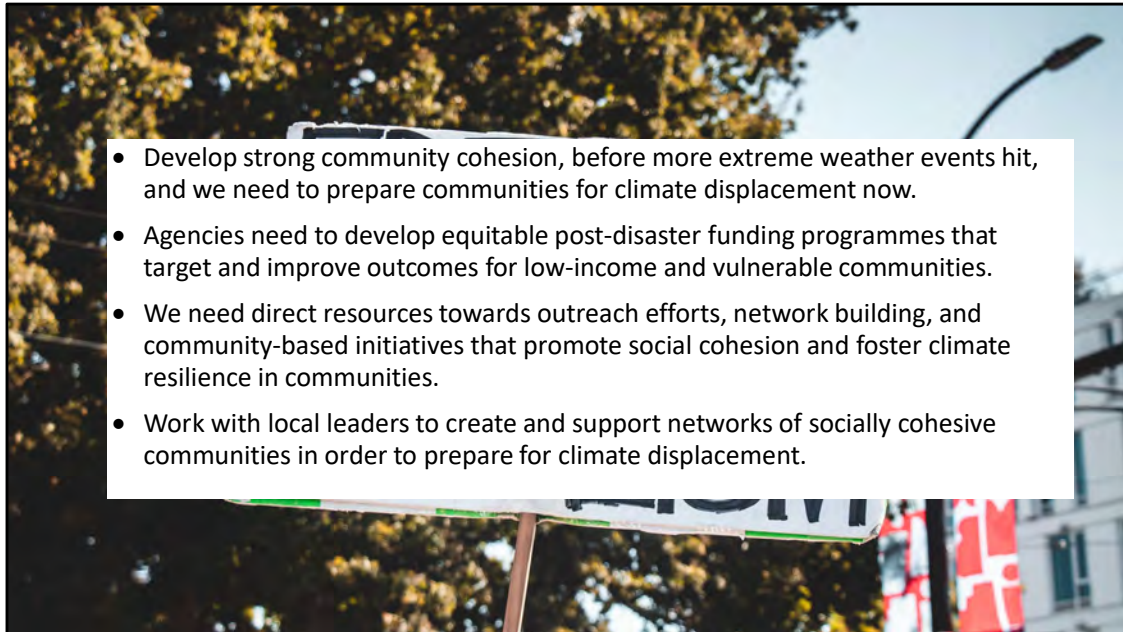
COVID has highlighted two vital things in my mind:

The first is that social cohesion once lost is extremely difficult to restore especially if people and their communities feel like the decisions being made are 'top-down' and divisive. The role social cohesion plays in preparedness and response to climate change and the associated extreme events, will need to focus on vulnerable and low-income communities because if the reactions of some segments of our community to the vaccine mandates and lockdowns are a signal of what's to come when we really need to implement climate mandates, then we are going to have some very real social and security issues.



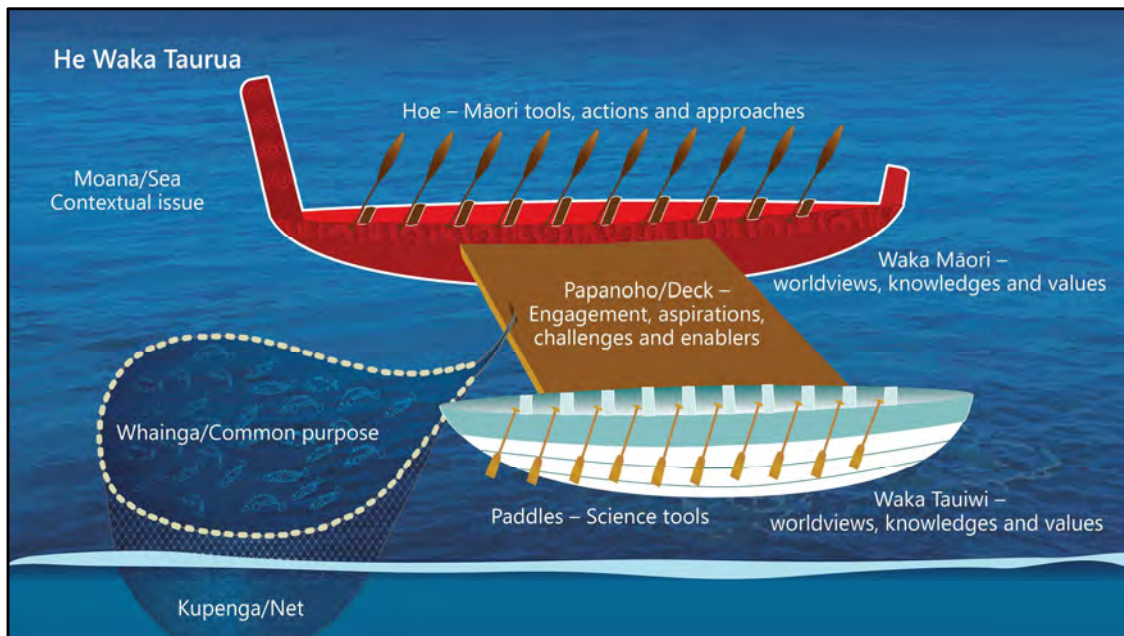
I'm not saying that vulnerable and low-income communities are those who will resist strongest, in fact my experience as a researcher studying the Christchurch earthquakes and biosecurity incursions would suggest that it is those communities that can actually afford to adapt that will struggle mentally and emotionally and use that to push for change. But they will do so using legal and political avenues (for example in Christchurch it was professionals and the wealthy who pushed our emergency services to give them access to red-zoned buildings and who struggled to comprehend that insurance companies wouldn't just pay out, and during the myrtle rust incursion it was lawyers in wealthy Auckland suburbs who fought to keep infect plants on their properties).

It will however, be vulnerable and low-income communities that will struggle to adapt and will suffer more because of decisions they have no influence over. So when they can no longer access or afford decent housing in areas with good infrastructure, and when extreme weather impacts their neighbourhoods, and climate taxes hit their already deficit budgets they will not litigate or lobby, they will protest and break the system. And who can blame them?



- Develop strong community cohesion, before more extreme weather events hit, and we need to prepare communities for climate displacement now.
 - Agencies need to develop equitable post-disaster funding programmes that target and improve outcomes for low-income and vulnerable communities.
 - We need direct resources towards outreach efforts, network building, and community-based initiatives that promote social cohesion and foster climate resilience in communities.
 - Work with local leaders to create and support networks of socially cohesive communities in order to prepare for climate displacement.
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- Right now we need to develop strong community cohesion, before more extreme weather events hit, and we need to prepare communities for climate displacement NOW.
 - We need agencies to develop equitable post-disaster funding programmes that target and improve outcomes for low-income and vulnerable communities. Not everyone has a Bach to go to.
 - We need to identify climate and socioeconomic vulnerability so we can direct resources towards outreach efforts, network building, and community-based initiatives that promote social cohesion in communities, and in turn foster climate resilience
 - We need to work with local leaders to create and support networks of socially cohesive communities in order to prepare for climate displacement.

Here I also want to give a selfish plug for the recently launched UN International Campaign for Disaster Risk Reduction in Indigenous Communities – look for information on our website, our students are busy developing an international indigenous youth disaster risk reduction network and pipeline for new young talent to enter the system.



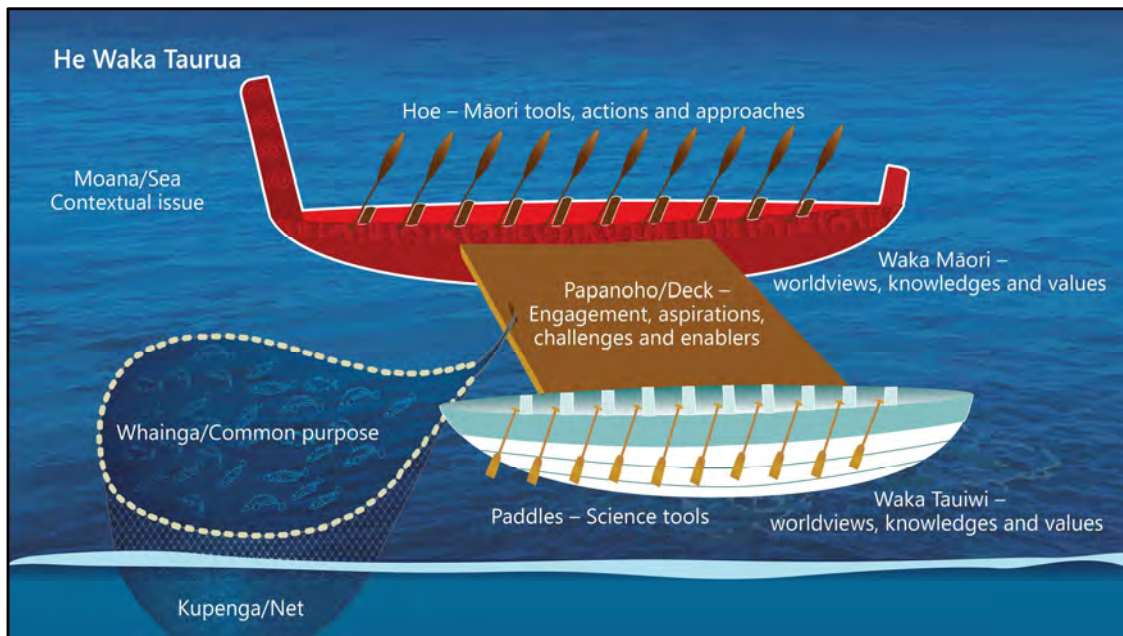
The second observation for me is that regionalisation is real and its exciting.

- Migration from large cities to regional areas is increasing and changing the way people want to participate in democratic systems especially those that manage the environment.
- Official figures show that close to 25,000 people have left Auckland city in the past two years. Offset of course by international migrants and new births. But people are also leaving Christchurch and Wellington Cities.
- This is good news for the regions though as districts like Selwyn, Tauranga City, Waikato District, my home Waimakariri and Whāngārei picked up about 60% of those residents leaving Auckland alone. This pattern is also being seen across Australia and in other western countries.
- You all know why people are shifting, you are working on the ground. You know that COVID-19 has supercharged a trend that was already emerging and being driven by living and housing costs.

But you also know that the lockdowns have shown agencies that people can remote work and still be productive.

- Anecdotal evidence would suggest that shifting work patterns have also attracted new talent and diversity into sectors that people wouldn't have considered in the past due to location. The amount of people who are now working for 'Wellington' but not based in Wellington is mind-blowing, and the talent government agencies have been able to attract is inspiring and hopeful.
- The evidence suggests that the Covid-19 lockdown highlighted for many their desire to spend more time at home and with family, and or be in places where the environment supports their lifestyle desires.

It is this desire to connect to, and spend more time at place and with family that I want to kind of end with.



As more people work from the regions, we see a number of things happen.

People become passionate about their communities – they spend time in local cafes, at local gyms, they join clubs and groups, schools and churches and they take an interest in how their towns and communities are run. We see significant changes to governance as people take an interest in democratic systems and push for local control.

People connect to mana whenua and they see that on the ground co-governance and co-management of resources is easy and often produces better outcomes. Iwi and hapū or mana whenua are no longer scary radicals you see on the TV or read about online, they are your neighbours and representatives on your school boards, church and or sports committees. In fact, Māori become a crucial foundation for your community-based programmes.

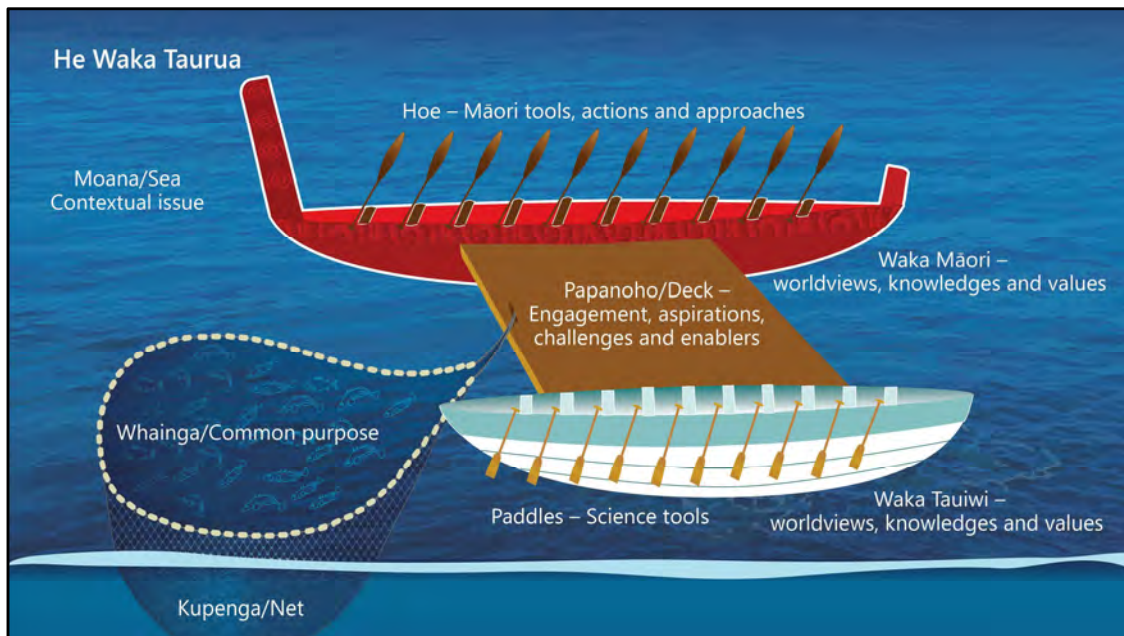
Secondly people become protective of their local environments, the ones they walk in weekly or daily, and they begin to look for local solutions and innovations. We no longer see people support the idea that every solution or process can be or should be scalable. In fact, the idea of nationalisation becomes abhorrent to some.

We realise that taking a regional view of environmental issues often helps us think more clearly about the issue and makes our actions more impactful. Because while climate change is affecting the whole world, the specific challenges for you and me at place and our abilities to respond are different.

The adoption of more locally focussed approaches to environmental issues mean we can tackle problems as they emerge – at a more manageable and less terrifying scale, and local approaches help us connect to the impact and the solution because we see the change.

Importantly local solutions mean local knowledge which again creates more space for mana whenua, and often better, newer ideas and innovations.

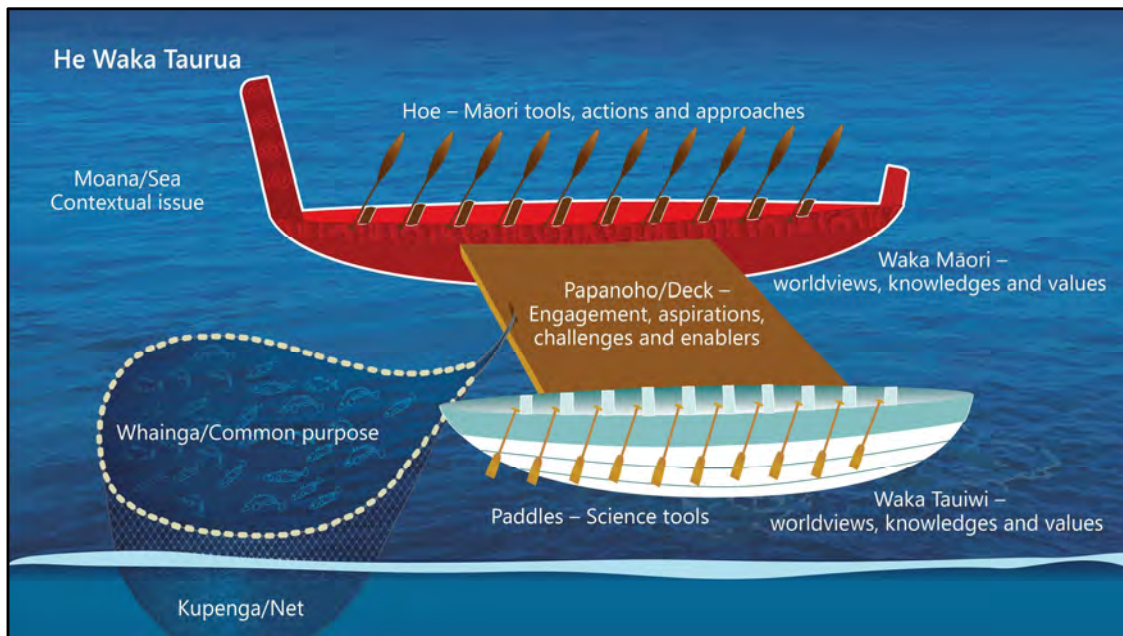
More people involved usually means better community resilience.



In conclusion it is that last point about making environmental issues more manageable, less terrifying, and locally focused that I want to comment on. Because what we often see in policy approaches to wicked complex problems – like climate change, pandemics, and disasters – is the promotion of two approaches.

The first is to assume that if we incorporate vast networks of societal stakeholders and non-governmental agencies into decision-making, if we reflect the diversity of affected views and values, access local knowledge, mobilise dispersed resources and build legitimacy via the construction of a common purpose and communal ownership of the problem and solutions, then we will address the expansive issues contained in the wicked problem – think Predator Free or the Biodiversity Strategy.

The second and quite common approach is that we move to reform based on a review that says we need to repair the damages of decentralisation and administrative retrenchment sustained under previous regimes, that we need to reinstate new forms of centralised control and that a ‘whole of government’ approach that empowers central government to regain or retain control will support our desired outcome – think Three Waters.



Both views suggest wicked problems require public authority to drive policy response. Neither of them support solving wicked problems outside of our public administration or ceding power to communities.

Counter to that, literature suggests that to address ill-defined and complex policy problems we should look for messy institutions; those with decentralised organisational structures; with an element of confusion and overlap in the jurisdictional boundaries; and with structures that can incorporate and institutionalise considerations of more, rather than fewer, dimensions of an issue. Because this will more likely give us a joined-up holistic approach – which by the way doesn't mean the issue is resolved but rather its controllable and manageable because we understand the complex components.

Effectively if we want new solutions that are transformative in that they are holistic and interconnected, acknowledge the relationship between people and nature, are inclusive not divisive, are intergenerational, and not top-down driven. And if we want all knowledge to be at the table especially indigenous knowledge because its landscape specific, understanding of environmental change over time, as well as accepting of local philosophies and approaches.

Then we need to be prepared to cede power to messy organisations i.e. communities. But equally we need to support them through resourcing, information, and network building.

Ngā mihi

Thanks to



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Ngā pātai

Questions for our presenters

Ngā mihi maioha

Thank you for attending



Supply chains and food security

Mahuru September 14

Dr Mark Begbie

PlantTech

TBA

**SPEAKER'S
SCIENCE
FORUM**

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