

# A SUMMARY OF MĀORI ISSUES FOR DISASTER RECOVERY IN THE ENVIRONMENTAL HEALTH FIELD<sup>1</sup>

Chris Webber

## ABSTRACT

This study set out:

1. To identify and demonstrate a body of knowledge relevant to Māori and environmental health disaster recovery (remediation of biological hazards, chemical hazards, and natural disasters);
2. To do it in a Māori-appropriate way that supports Māori research approach;
3. To provide something new and useful for Māori and other stakeholders involved in such issues.

A Māori-centred mixed methodology was used to guide research decisions and actions, including the development of a *Haurapa* approach based on the journey of a “typical Māori researcher.”

Through literature review, case studies, and semistructured interviews, a pool of knowledge was identified and used to derive a set of themes and

---

1. *Nga Mihi* – Acknowledgements

*Taku ngakau ki te Atua, nana nga mea katoa* — my heart to the Creator from whence all things come.

*He mihi ki nga tini mate kua haere ki tua o te Arai* — acknowledgement to those who have passed beyond the veil.

*Nga mihi hoki ki nga iwi whanui me nga kaitiaki/kaiarahi/kaitautoko* — to the tribes, guardians, leaders and supporters.

*Ki a Maui Hudson ma no te whanau a ESR, kia ora rawa atu ki a koutou mo nga tino tautoko* to the great support of Maui Hudson and staff of the governmental Environmental Science and Research Institute.

*He mihi aroha ki taku kare a Jacque me nga tamariki* — love to my wife Jacque and our children.

*Tena korua Te Kani Kingi raua ko Philip Dickinson no Te Whare Waananga o Massey mo nga whakaaro pai e pa ana ki te pepa nei* — to the guidance of Massey University supervisors Te Kani Kingi and Philip Dickinson.

*He mihi ki a tatou katoa* — thanks to all who have contributed.

*Kia kaha, kia maia, kia manawanui* — be strong, be brave, be courageous.

indicators which complement others in related fields. New knowledge was validated against related findings. Use of the findings is demonstrated, along with ideas for future application and testing.

A conceptual “*Pa* model” is proposed as a way to approach the subject for engagement with Māori and improved understanding of the context. Existing frameworks are adapted for this topic, including a useful tool for filtering potential indicators.

In conducting this study, the following hunches or hypotheses were considered:

- That Māori are not adequately prepared or included regarding modern hazards and disaster response.
- A lack of Māori involvement results in inequalities.
- Valuable gains can be made with a Māori-centred approach and proper treatment of Māori issues.

The conclusion supports the statements and recommends further development along with a invitation to join an international indigenous environmental health forum.

## INTRODUCTION

This study was approached from the researcher’s perspective as a former “Māori health inspector,” analyst/journalist/educator, and Māori development practitioner. It sought things like improved policy and service, Māori health outcomes, community development, and the desire to bridge science/indigenous/spiritual perspectives to make a difference for people of *Aotearoa* New Zealand and beyond.

With this bias in mind, along with the researcher’s background, the reader is invited to decide what is most important to take from the material presented. Information is drawn from people of Māori and non-Māori backgrounds, having working knowledge of Māoridom and/or disaster recovery. Other information is drawn as deemed appropriate for the methodology chosen. A glossary is provided at the end to assist with Māori words and acronyms.

### *KO WAI AU?* – ABOUT THE RESEARCHER

The following *pepeha* helps locate the tribal area and ancestry of the researcher:

*Kapiti te motu*  
*Raukawa te moana*

Kapiti is the Island  
Cook Strait is the sea

<i>Waikanae te awa</i>	Waikanae is the river
<i>Whakarongotai te marae</i>	Whakarongotai is the marae
<i>Ngati Toarangatira, Te Ati Awa</i>	Ngati Toarangatira, Te Ati Awa
<i>me Ngati Raukawa nga iwi</i>	and Ngati Raukawa are the tribes
<i>Ko Wi Parata Te Kakakura te tangata</i>	Wi Parata Te Kakakura is the ancestor
<i>Nana ka puta mai a Utauta,</i>	From him came Utauta,
<i>Nana ko Tukumarū</i>	From her came Tukumarū
<i>Nana ko Hemi (Jim) Webber toku papa.</i>	From him came Jim Webber my father
<i>Ka moe i a Pamela Gosling no Ingarangi</i>	He married Pamela Gosling from England
<i>ka puta mai ahau te potiki o nga toru</i>	Resulting in me, the youngest of 3 sons

My father's great grandfather Wi Parata was our first Māori member of the Parliamentary Cabinet (Executive) in the 1870s and was a grandson of chief Te Rangihiroa, who signed our nationhood document the Treaty of Waitangi in 1840. Justice and equity is in the blood along with a leadership role to sustain the people. I draw inspiration from our tribal leader Te Rauparaha who composed the famous *ka mate haka* performed by kiwis at sporting and special events around the world.

## WHY THIS STUDY?

This study was conducted as partial fulfilment for a Masters in Philosophy Degree with Massey University (with a Māori Environmental Health focus). It draws from a science background in the applied environmental health and protection field, with specific focus on the area of biochemical hazards and natural disaster recovery.

The following issues are contributing factors for the subject chosen.

- Lack of Māori knowledge and involvement in the field — leading to gaps and inequalities.
- Improving response capacity in *Aotearoa* New Zealand — linking with emergency preparedness work of our government science agency ESR (the Environmental Science and Research Crown Research Institute), which provided a research scholarship for this study.
- Developing a specialist field for Māori participation — an opportunity as a practitioner to “drill down” into one area of environmental health and protection interest (disaster recovery) and promote further consideration of Māori issues.

## ABOUT THE TITLE

The working title for this study was originally “Māori Cultural Indicators for Remediation of Bio-hazards, Chemo-hazards and Natural Disasters.” During

write-up, the title changed to “Māori Issues...” instead of “Māori Cultural Indicators...” as it became clear the information coming back was more general than specifically about indicators. Whilst some cultural indicators are involved, the wider considerations are better summed up as Māori issues. There are not enough adequately equipped people available to discuss disaster recovery indicators for Māori in depth – the focus keeps coming back to more generic issues and values.

In breaking down meanings of the title keywords, “issues” is a catch-all phrase but the others are still worth examining, including the cultural indicators of interest.

### CURRENT KNOWLEDGE

In preparation for the study, information was gathered to establish a starting point from existing knowledge and ideas, including:

1. A breakdown of the keywords and terminologies used (see Appendix 1).
2. Literature review and searches for related studies, case studies, and documents.
3. Collation of further ideas for tackling the subject, which has little obvious Māori involvement.

## ABOUT THE STUDY

Having established the aims of the study and feedback from Māori and other stakeholders, it was decided a Māori responsive research approach was required to deal with Māori knowledge and aspirations.

### METHODOLOGY

Methodology helps explain why certain research design and methods are used to gain the new knowledge desired. It also dictates how knowledge is treated and validated.

This study draws on both Western and Māori world views or research paradigms, with the aim of “mana-enhancing” both for a win-win solution. Two Western terms that address these paradigms are ontology and epistemology, which talk about the nature of reality and how we interpret and deal with the world we see. Ontology is “an inventory of the kinds of thing(s) that do, or can, exist in the world [affected by our belief systems].... Epistemology is the philosophical theory of knowledge ... how we know what we know...what counts as legitimate knowledge” (Davidson and Tolich, 1999, pp. 23–26).

A Māori research framework was chosen for this study to ensure Māori consideration is fully included, based on a Māori ontological and epistemological position. However, a mixed methodology was employed involving Western methods like literature review, interviews, and case study based on more Western ontology and epistemology. A *Haurapa* research approach was developed to inform the journey of discovery by a “typical” Māori researcher. *Haurapa* is a Māori word meaning “to diligently search for.”

## TOOLS AND METHODS

Tools selected as the appropriate way to proceed included literature review, case studies, *hui* (Māori gathering) presentations and a dozen semistructured interviews of both Māori and emergency stakeholders. A discussion starter and sample questions were provided to encourage thinking and feedback (see Appendix 2). Ethics approval, participant selection, and data treatment followed established research guidelines. Māori cultural expectations were also followed.

## INTERVIEW RESULTS

There was a noticeable difference in feedback between “types” of participant which helped distil themes and indicators. Examples include the more child-protective focus of a Māori mother of young children, the world view considerations of a Māori departmental advisor, and the politically charged assertions of a community leader. Views of non-Māori participants were less differentiated other than relating to the departmental portfolio they served.

Participant types were identified as:

- A *whanau* (family) member (to the researcher) — 30 something mother of four, with Māori upbringing and employed in the health sector).
- A *kaumatua* (Elder) from Te Arawa tribe — community leader active in local/regional tribal development and government sector including health.
- *Tohunga*/Māori expert in the environmental health field — active in national Māori workforce development and advising government health sector.
- Māori leader with a national profile, experience in civil defence, military, Māori development, consultancy and leading Māori institutions.
- Government department Māori advisors (several) with policy and technical backgrounds in environmental health-related fields.

- Departmental nominees from Environmental Risk Management Authority (ERMA), Ministry of Health (MoH), Ministry of Agriculture and Forestry (MAF) and the Fire Service Commission – mostly Māori.
- Ministry of Health participants (2) were:
  - A project manager with public health background
  - An emergency management professional new to New Zealand
- Some participants also had policy/advice background with Ministries for Environment and Māori Development

**INTERVIEW RESPONSES**

Valuable insights to each of the participant types were recorded by way of key comments and quotes, helping to establish themes and indicators, which are summarized in Tables 1 and 2 below. The following preinterview responses are provided as an example:

*Some preinterview responses*

That’s scary to start with [information sheets] ... too much writing/off putting ... this is for only certain types ... can’t take in too much ... build rapport with small goals lest people don’t come back. (Māori mother)

Make sure we start interview with *karakia* (prayer). (Māori Practitioner)

Will need to confirm approval to use knowledge belonging to others. (Departmental Māori Advisor)

An indicator inspired from these three responses is “how many agencies are applying a Māori responsive checklist before engaging with Māori participants?” Māori may avoid one-off agency consultations based on a fat wordy document with no regard for treatment of restricted knowledge.

**Table 1: Theme Summary by Participant Type**

<i>Participant (10)</i>	<i>Themes Raised (27)</i>
Māori mother	Different responses from different Māori types The need for Māori to be more educated and informed An expectation for services to be Māori responsive
<i>Te Arawa kaumatua</i> (Elder)	Resource ownership Spiritual dimensions Leadership issues Likely scenarios
<i>Tohunga</i> /Māori expert	Local authority/health agency relationships Varied state of readiness amongst Māori communities Key priorities and approaches
Departmental Māori advisor	Māori responsiveness Good process/suggested improvements Māori perspective/risk perception

**Table 1 cont.**

<i>Participant (10)</i>	<i>Themes Raised (27)</i>
Departmental Māori policy person	Cultural practice case examples Departmental process Māori understanding of environmental process
National service senior Māori advisor	Strengths in departmental Māori responsiveness Departmental realities/limitations Māori community realities Practitioner tips
Māori institutional leader	Māori reality/case studies Likely scenarios Useful advice
Departmental Māori analyst	Agency inclusion of Māori Potential impacts for Māori community
Tauīwi emergency management professional	Limited involvement of Māori
Tauīwi departmental project manager	Limited resource for inclusion of Māori issues

**Table 2: Indicator Summary by Participant**

<i>Participant (10)</i>	<i>Potential Indicator (32)</i>
Pre-engagement	Has a Māori responsive checklist been applied before engaging with Māori participants?
Māori mother	How often Māori become sick after eating food from traditional sources Participation levels from Māori women/mothers
<i>Te Arawa kaumatua</i>	Time taken for clean-up/remediation of local environmental incidents Local reports of dying species Presence of suitably committed agency staff Appropriate timeframes used for community interaction Proper regard given for mauri of a resource Breaches of tapu/lack of proper regard Spiritual level of cleansing required Incidence of spiritual cleansing carried out Capacity of agency to deal with cultural indicators
<i>Tohunga</i> /Māori expert	Numbers of non-Māori workers using <i>waiata</i> -practice to satisfy professional development credits for Māori responsiveness How overloaded people are with other priorities
Departmental Māori advisor	Willingness of departmental/ science personnel to accept/value Māori knowledge Tracking personnel (and resource) against the Māori responsiveness ladder Track categories of alert/response/outcome for selected case study areas like mauri impact assessment
Departmental Māori policy person	Progression from one state to another of <i>whanau</i> recovery from <i>hara</i> (transgression/bad thing) Planning of resources for future capacity The ability to sustain selves and <i>manaaki</i> /honour others
Senior Māori advisor	Presence of <i>kaumatua</i> /other experienced Māori support Links to socioeconomic indicators

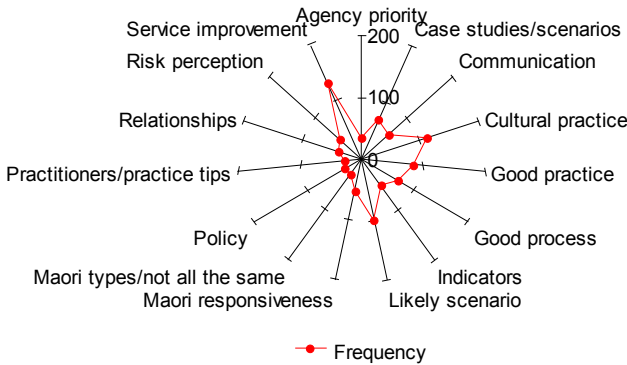
**Table 2. cont.**

<i>Participant (10)</i>	<i>Potential Indicator (32)</i>
Māori institution leader	Ability to include cultural process (like <i>karakia</i> ) Culturally secure destinations/outcomes Evidence of Marae community growth and strength Prevalence of key community resource people (food gatherers, organizers, “clever-types” etc.)
Department Māori analyst	Levels of Māori/unit participation in certain processes
Emergency professional	Māori responsiveness statements within SOPs/other Availability, resource and skill base of Māori units
Department project manager	Number of national/local forums to engage Māori Evidence of Māori participation/feedback

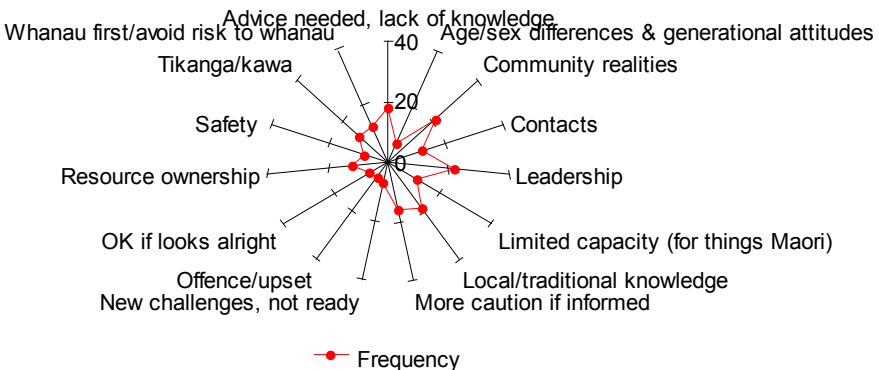
## THEMATIC ANALYSIS

As an alternative approach to the interview themes, line-by-line classification of interview notes resulted in the 45 most recorded themes as illustrated below.

### Top 15 Themes

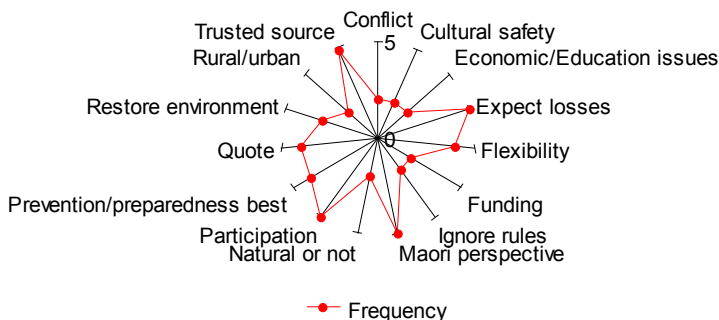


### Mid-15 Themes



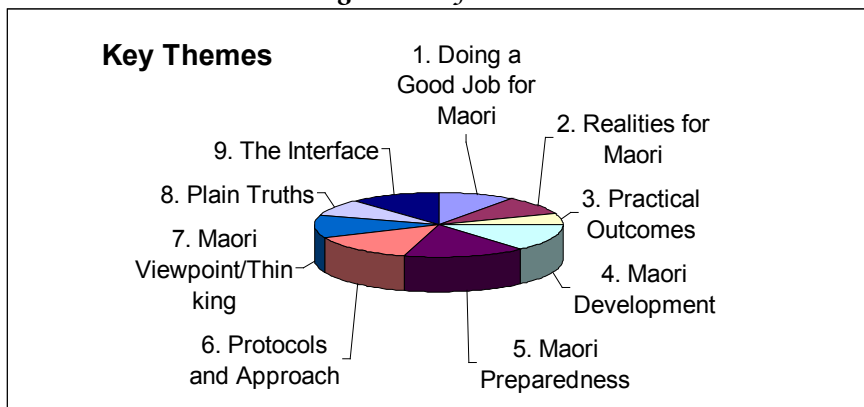


**Bottom 15 Themes**



The 45 themes were then distilled into 9 key themes as represented proportionally in the pie chart below in Figure 1 below:

**Figure 1: Key Themes**



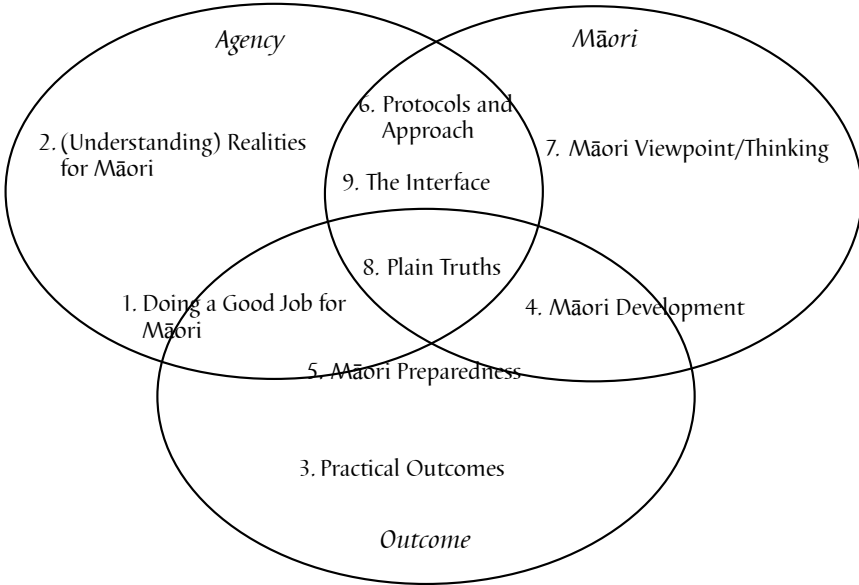
The validity of the key themes were tested by applying seemingly important but previously unranked themes (maybe with only a single interview mention) to find that they fit well with the key themes. The pros and cons of using the themes for a weighting system were discussed, along with other Māori models and frameworks. For example, the unranked themes include weighty subjects like busy Māori staff, intellectual property, and Māori risk perception – hence the advice to not rely solely on new tools at the expense of existing wisdom.

**ALLOCATING THEMES FOR ACTION**

Three spheres of interest are considered for allocating action around the nine key themes – agency-focussed issues, Māori-focussed issues, and best

outcomes-focussed issues, as inspired by the *Korowai Oranga* triangle used for the NZ Māori Health Strategy. Figure 2 below suggests where key themes might sit as a guide for stakeholder focus.

**Figure 2: Allocating Themes into Spheres of Interest**

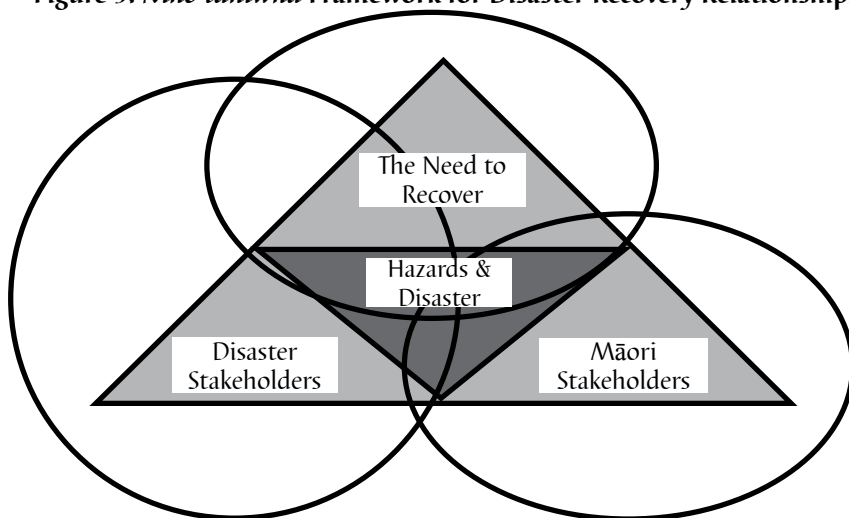


Summarizing the diagram into simple statements:

- Māori need to develop and articulate their thinking and viewpoints about certain scenarios and technical issues. They also need to relate it to outcomes relating to their own Māori development aspirations.
- Agencies need to better understand Māori realities and then the outcomes of doing a good job for Māori (both agency and Māori aspirations).
- Between them as partners, Māori and agencies need to develop the interface including appropriate protocols and approach, whilst being real about the plain truths to be kept in mind in achieving outcomes.
- With the above things in place, Māori preparedness for participation in and recovery from disaster scenarios should be the mutual outcome along with other practical outcomes that all stakeholders are interested in. These include aspects of Māori development, service development (both doing a good job for Māori), and plain truths including the way the relationship works and issues are communicated.

An alternative way to represent relationships around these spheres of interest for disasters is to superimpose a Māori *niho taniwha* design (Figure 3) below.

**Figure 3: Niho taniwha Framework for Disaster Recovery Relationships**



*Explanation:* The uppermost priority as the point of focus is the need to recover from disaster. Māori and disaster stakeholders are equal partners in this, each with their own spheres of interest. The larger and more intersecting the spheres of interest, which contain themes like those identified above, the better the hazard and disaster “wedge” between them will be covered. For example, Māori may be frustrated where the disaster stakeholder sphere does not intersect with their need to recover (like spiritual remediation). Similarly, disaster stakeholders may find the Māori sphere not as big as theirs when discussing the need to prepare for certain disaster scenarios (like a pandemic).

## DISCUSSION

Excerpts from the thesis discussion are provided below as follows:

1. Validating the findings as part of a knowledge base;
2. The study and Māori research approach; and
3. Usefulness of outcomes and next steps.

### 1. VALIDATING THE FINDINGS AS PART OF A KNOWLEDGE BASE

An important philosophy for this study was not to forget or minimize the wisdom that has been handed down by Elders and others who have gone

before. In other words, “don’t keep reinventing the wheel” and “it’s been said before” – so the study refers back to previous wisdom where practical.

Study findings are triangulated by comparing them against other sets of information or reprocessing in different ways, including:

*Comparison against Māori reference group statements*

Māori reference group statements recorded at *hui* overlap with many of the key themes and indicator ideas. An example of a reference group idea that didn’t overtly appear in the study is the term “cultural toxicity” (things that harm or place Māori culture at risk). However, it can be discerned in other ways from the study findings such as a potential indicator measuring breaches of *tapu*, reports of dying species, or falling usage of responsiveness checklists.

*Comparison with identified Environmental Performance Indicators*

By substituting disaster recovery terms for environmental ones, the Māori themes and comments found in this study align to those of New Zealand’s Environmental Performance Indicator program (Ministry for the Environment [MFE], 1998). This endorses the quality of the original EPI program advice and robustness of the Māori principles and issues in dealing with things in a holistic way.

Treating identified indicators from this study in a similar way to those of the EPI program produced a table of indicators classified into four areas: environment-based, people-based, pathway-based, or *tikanga*-based. To find the best ones to work with, the indicators were identified as objective/subjective, stage 1 (existing data sets)/stage 2 data sets and of key interest to Māori, agency, or outcome-based focus (Table 3).

**Table 3: Sample of EPI-type Filter for Indicators**

<i>Indicators</i>	<i>Stage</i>	<i>E/P/Pa/T</i>	<i>M/A/O</i>	<i>S/O</i>
Availability, resource and skill base of Māori units	1	P	A	O
Application of Māori responsive checklist before engaging with Māori	1	P	A	O
Number of national/local forums to engage Māori	1	P	A	O
Numbers of non-Māori workers using <i>waiata</i> -practice to satisfy professional development credits for Māori responsiveness	1	P	AO	O
Time taken for clean-up/remediation of local environmental incidents	1	EP	AO	O
Presence of <i>kaumatua</i> /other experienced Māori support	1&2	PT	MAO	SO
Local reports of dying species	1&2	E	MO	SO
Number of Māori becoming sick after eating food from traditional sources	1&2	PaP	MO	SO

Legend: E/P/Pa/T = Environment/People/Pathway/Tikanga-based indicators; M/A/O = Māori/Agency/Outcome-based focus; S/O = Subjective or Objective measurement

The use of such a table to filter indicators provides a new tool to select the best indicators (current data sets, objectively measured) to work with in each of the Māori, agency or outcome areas of focus. This is demonstrated further in the new tools discussion below. See Appendix 3 for the full tables.

### *Internal comparison via data-processing and conceptual models*

Themes for the study were arrived at from two directions — distilling participant comments into themes and ranking line-by-line classifications drawn from interview notes. Comparative tables for the two sets of themes confirm they share much in common, perhaps stated in slightly different ways.

Well-known Māori health conceptual models mentioned in the study can successfully be applied to show alignment with the themes and indicators identified (*Te Whare Tapa Wha*, *Te Pae Mahutonga*, *Korowai Oranga*, etc.). In line with study aims to evolve new thinking whilst retaining the wisdom of old, the concept of a traditional palisade-fortified *pa* (traditional Māori village) is adopted to signify key elements of a new conceptual *Pa* model for engagement with Māori.

### Conceptual *Pa* Model



Each of the fence posts of this conceptual model represents a Māori custom/*tikanga*-based indicator (outer fence), people-based indicator (middle fence) or environmental indicator (inner fence). The outer *tikanga*-based indicators are often the first thing experienced by those approaching Māori over issues. Problems can be detected via indicator posts if “perceived invaders” break through without coming through the appropriate gateway by right

of passage and trusted relationship.

Better prepared stakeholders deal well with *tikanga* protocols and are open to hearing some of the people-based indicators (even if their silo is not set up to address them). This may get them through the second gate with a chance to negotiate the inner environmental indicators fence and achieving a clearing for further open discussion. Perhaps only the most committed and true visitors (with a track record of good actions) are welcomed to build a two-sided house of trust with the people.

Detecting which visitors are committed and true, building relationships, avoiding offence and managing rites of passage in protection of the people are all specialties Māori have perfected over generations of intertribal dynamics and passed down through customs still in practice today. Of any of the learning from this study, these distinctions could override all others.

Posts in each of three concentric perimeter fences around the *Pa* site represents a *tikanga*-based indicator (outer fence), people-based indicator (middle fence) or environmental indicator (inner fence). The outer *tikanga*-based indicators often the first thing experienced by those trying to negotiate the narrow gate access in each fence to approach Māori over core issues. Perceived enemies can be repulsed at each fence if they try to break through to core issues without a “right of passage” relationship of trust.

## 2. THE STUDY AND MĀORI RESEARCH APPROACH

One of the aims for this study was to conduct it in a way that was both appropriate from a Māori perspective and could demonstrate a simple but useful research approach likely to be of relevance to many Māori.

Examples of options chosen from a Māori standpoint range from developing the *haurapa* approach within a *kaupapa* Māori methodology, setting up several Māori reference points (reference groups, yahoo website, occasional *korero* with *kaumatua*/mentors) or even just the inclusion of easy access tools like Wikipedia, shunned by academia but likely to be popular with the new wave of beginning Māori researchers.

Overall, the objective has been met by introducing some Māori thinking (without giving away too much) within a *tauiwi* research framework and finding something that could be useful for Māori and other stakeholders.

## 3. USEFUL OUTCOMES AND NEXT STEPS

The third aim of the study was to end up with something useful to all stakeholders. Excerpts from the study about this are included in three parts:

- i. New tools
- ii. The stakeholders
- iii. Indicators of success

### *i. New tools*

New tools from the study were largely developed by:

- breaking down what people have said about the topic;
- amending other models and frameworks to apply here; and/or
- thinking about and conducting things in a more Māori-centred way.

For example, the interview-derived indicators (and amended EPI table) in Appendix 3 filters out indicators an agency might start to work with as in Table 4 below.

Substituting “remediation” for “research” in Durie’s Research Potential Framework (Durie, 2003) ensures the retention of timeless Māori concepts

**Table 4: Suggested Indicators for Agency Focus**

<i>Type</i>	<i>Indicator</i>
<b>Environment</b>	Time taken for clean-up/remediation of local environmental incidents
<b>People</b>	Availability, resource and skill base of Māori units Application of Māori responsive checklist before engaging with Māori Number of national/local forums to engage Māori Numbers of non-Māori workers using <i>waiata</i> -practice to satisfy professional development credits for Māori responsiveness Presence of <i>kaumatua</i> /other experienced Māori support Links to socioeconomic indicators
<b>Pathway</b>	Number of Māori becoming sick after eating food from traditional sources
<b>Tikanga</b>	Presence of <i>kaumatua</i> /other experienced Māori support; Incidence of spiritual cleansing carried out (limited dataset/maybe hospitals)

to provide equally sound guidance for the topic of this study. The stated aims from Durie’s framework also transfer across to determine whether remediation is coherent, accords with the main concepts underpinning Māori cultural and spiritual views, and is likely to make a positive contribution. See Table 5 below.

**Table 5: “Remediation Potential” Framework**

<i>Domain</i>	<i>Māori value/Concept</i>	<i>Desired Remediation Outcome</i>
The natural environment	Mauri Integrity	<b>Remediation</b> that contributes to the integrity of ecological systems
	<i>Whakawhanaungatanga</i> Relationships	<b>Remediation</b> that strengthens relationships between people, between people and the natural environment, and between organisms
	<i>Kaitiakitanga</i> Guardianship	<b>Remediation</b> that contributes to resource sustainability
The human condition	<i>Wairua</i> Spirituality	<b>Remediation</b> that contributes to human dignity within physical and metaphysical contexts
	<i>Tapu</i> Safety	<b>Remediation</b> that contributes to human survival and safety
	<i>Hau</i> Vitality	<b>Remediation</b> that contributes to maintenance of human vitality
	<i>Whakapapa</i> Intergenerational transfers	<b>Remediation</b> that contributes to the standing of future generations
Procedural confidence	<i>Tikanga</i> Protocols	<b>Remediation</b> that contributes to the development of protocols to address new environments

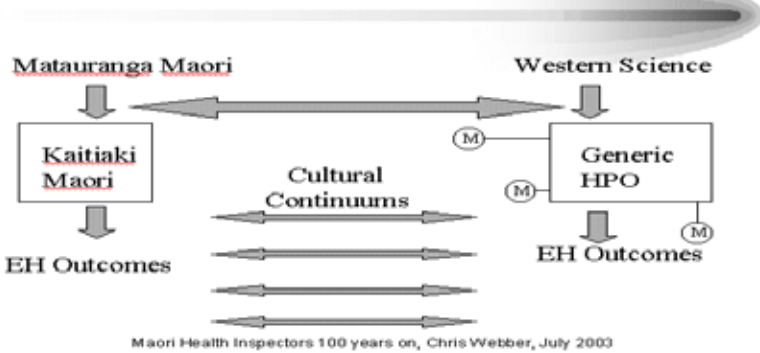
In a similar way, various established Māori conceptual models can provide a basis for approaching new knowledge from the disaster recovery field. For example, physical, spiritual, social, and mental aspects of The *Whare Tapa Wha* model, could be used to drive indicator filtering. The “defensive” conceptual *Pa* model introduced previously was chosen as an appropriate way to put the indicators into a familiar traditional format and Māori-centred way of thinking. The new tool has already been well received at *hui*.

ii. *The stakeholders*

The usefulness of study outcomes depends on what terms of reference each stakeholder has for Māori issues and where each sits on the continuum towards integration of Māori aspects in disaster recovery. Whilst many Māori face extreme scrutiny from their own communities, agencies are often only required to “have regard” to things Māori and may place them in the “too hard” basket compared to higher priorities. The study introduces tools to assess the capacity and responsiveness of Māori and emergency stakeholders.

In summary, stakeholders will take what they want from the results of this and other studies, depending where they sit on the Māori responsiveness continuum and the commitment of individuals to apply the effort (see Figure 4 below). The key message is for stakeholders to be aware of such continua, where they are located on them, and what options for progress there may be. Raising such understanding and awareness is a useful outcome from this study.

**Figure 4: Conceptual Framework Locating Individual Māori Responsiveness**  
*A Conceptual Framework*



Māori Health Protection Officers (M) are employed as “clip-ons” to the generic health protection role (informed by Western approach) to achieve environmental health outcomes – but work at varying points along the continua towards a *kaitiaki* Māori role (informed by Māori knowledge and practice). Various continua exist for duties due to being male or female, young or old, Māori or non-Māori and staunch traditionalist or novice learner of the culture (Webber, 2004).

iii. *Indicators of success*

In trying to fit at the interface between Western and indigenous, government and community, science and layperson, Māori and non-Māori viewpoints an “end result” question could be posed:

*From the findings, what is likely to be of most use to each stakeholder that will support/promote best outcomes?*



Some ideas include:

- a useful policy guideline document or checklist;
- a handy office resource like a wall chart or field toolkit;
- new/improved communication channel(s)/decision-making process;
- a wave of knowledge transfer within stakeholders and/or community;
- plans/openings/assurances for dialogue between stakeholders (including Māori) for certain situations;
- a measurement tool for the way Māori experience disaster recovery;
- a ground-breaking model to share with others wanting to include community/cultural indicators in the way they carry out disaster recovery.

Resource limitations and other priorities make significant change unlikely without some kind of driver. As with the proposed *Pa* model, all other considerations may be academic unless Māori welcome stakeholders and choose to participate where relationships of trust and reciprocity may evolve. Indicators of success are then more about stakeholders' understanding and applying principles of engagement. The findings from the study shed useful light and support further engagement and indigenous development.

## CONCLUSION

This study achieved its aims to demonstrate a body of knowledge around Māori and disaster recovery, in a Māori appropriate way with useful outcomes for stakeholders.

Māori are not engaged enough to generate in-depth response to many technical aspects of disaster recovery, being underrepresented and less likely to achieve equitable outcomes in this field. Protocols for engagement must be followed by stakeholders and long-term relationships formed with Māori to develop responsiveness in this field.

A general lack of Māori involvement in related scientific and regulatory fields requires innovative use of available knowledge and tools. A Māori-centred *Haurapa* approach was demonstrated as a useful Māori research approach. Existing Māori conceptual models can be easily adapted to apply to this field rather than reinventing the wheel.

Nine key themes were distilled from more than fifty from interviews. Over thirty themes are supported with useful quotes to provide insight for those looking into the area. Separation of the themes into spheres of interest makes them useful in setting out stakeholder roles and prioritizing actions of each for mutually beneficial outcomes.

From this process the following suggestions are made:

- Māori need to develop and articulate their thinking and viewpoints about disaster scenarios and technical issues. They also need to link it to outcomes relating to their own Māori development aspirations.
- Agencies need to better understand Māori realities and the outcomes of doing a good job for Māori (both agency and Māori aspirations).
- Between them as partners, Māori and agencies need to develop the interface including appropriate protocols and approach, whilst being real about the plain truths that need to be kept in mind in achieving outcomes.

The 9 Key themes are:

1. Doing a good job for Māori
2. Realities for Māori
3. Practical outcomes
4. Māori development
5. Māori preparedness
6. Protocols and approach
7. Māori viewpoint/thinking
8. Plain truths
9. The interface

While the study generally approaches the topic under the banner of “Māori Issues,” a dozen stage-one indicators (with current datasets likely) are identified to provide objective measurement under classifications (environment-based, people-based, pathway-based and *tikanga*-based). Twenty stage-two indicators requiring development and datasets are identified. The indicators can be successfully filtered to select the best ones for each sphere of interest (Māori, agency, and outcomes).

A number of different tools and applications are introduced for trial and further development. Long term relationships of trust and engagement with Māori are needed to include Māori cultural indicators and issues in the disaster recovery field involving biohazards, chemo hazards, and natural disasters. There are definite gains to be made — the consequences of not doing so are high.

The approach for Māori involvement should be considered within a Māori framework like the conceptual *Pa* model proposed. This considers *tikanga*, people, and environmental indicators along with evolving relation-

ships of trust — inviting Māori engagement and better understanding between stakeholders. Presently, the issue of Māori engagement with disaster recovery may be considered still external to the outer palisade — this study providing just a few glimpses through the gaps.

## CALL FOR INTERNATIONAL INDIGENOUS ENVIRONMENTAL HEALTH FORUM

While there will always be benefits to be gained from indigenous studies to develop issues within wider nonindigenous frameworks — it will not be enough to make the real difference being sought by indigenous nations and practitioners. Neither will it stop the ongoing inequalities faced by indigenous peoples, particularly in preparation for the environmental health challenges to come.

Transformation lies in the maintenance of indigenous peoples and their own eternal truths and relationships, and the ability to marry these with the tools of today to make a difference for their communities. Environmental health practitioners working at this interface are invited to join an International Indigenous Environmental Health Forum to help achieve this end (search online with Facebook/Google, nominate representatives, maintain networking, and initiate actions).

## REFERENCES

- Atkinson, A.S. (1892). What is a Tangata Māori? *Journal of the Polynesian Society*, 1(3), 133–136. Accessed online 18 December 2007 via [http://www.jps.auckland.ac.nz/document/Volume\\_1\\_1892/Volume\\_1%2C\\_No.\\_3%2C\\_1892/What\\_is\\_a\\_Tangata\\_Māori%3F\\_by\\_A.\\_S.\\_Atkinson%2C\\_p133-136?action=null](http://www.jps.auckland.ac.nz/document/Volume_1_1892/Volume_1%2C_No._3%2C_1892/What_is_a_Tangata_Māori%3F_by_A._S._Atkinson%2C_p133-136?action=null).
- Davidson, C. and Tolich, M. (1999). *Social Science Research in New Zealand: Many Pathways to Understanding*. Auckland: Pearson Education New Zealand Limited.
- Durie, M. (2003). *Mana tangata: Culture, custom and transgenic research*. Deputy Vice-chancellor's Lecture. Palmerston North: Massey University.
- Food and Agriculture Organization (FAO). (2007). *SARD and Indigenous Culture*. Web-published article accessed March 2008 at <http://www.fao.org/sard/en/init/964/2687/2453/index.html>.
- Ministry for Culture and Heritage (MCH). (2007). Cultural Statistics Programme on the *Ministry for Culture and Heritage* website, retrieved 2 April 2007 from <http://www.mch.govt.nz/projects/culture/stats.html>.

Ministry for the Environment (MFE) (1998). *Tohu Waotu – Māori Environmental Performance Indicators*. Wellington: Ministry for the Environment.

Webber, C. (2004). *Māori Health Protection Scoping Paper*. Accessed via [http://www.angelfire.com/me/manakupu/images/Māori\\_HPO\\_Scoping\\_Paper\\_June04.pdf](http://www.angelfire.com/me/manakupu/images/Māori_HPO_Scoping_Paper_June04.pdf).

## APPENDIX 1 - KEYWORDS AND TERMINOLOGIES

### MĀORI

Māori refers to the indigenous people of New Zealand and their language. In the Māori language, the word *māori* means “normal,” “natural,” or “ordinary.” In legends and other oral traditions, the word distinguished ordinary mortal human beings from deities and spirits (*wairua*) (Atkinson, 1892).

It is important to note that Māori are not all the same and have different views and perspectives on things just like non-Māori. This can be especially true as traditions and beliefs vary between one tribal area and another.

### CULTURE

Culture can be defined as all the ways of life including arts, beliefs, and institutions of a population that are passed down from generation to generation. As “the way of life for an entire society” culture includes codes of manners, dress, language, religion, rituals, norms of behaviour such as law and morality, and systems of belief as well as the arts. Various definitions of culture reflect differing theories for understanding, or criteria for evaluating, human activity.

### MĀORI CULTURE

Māori culture has a rich and distinctive history, some of which now forms part of everyday New Zealand culture. International audiences may recognize the *haka* (war dance) performed at sporting and special events, whilst Māori language and customs are increasingly seen as fundamental to New Zealand culture as a whole. There are still many traditional aspects not fully understood or embraced by wider society.

### INDICATORS

Ecological indicators are used to communicate information about ecosystems and the impact human activity has on ecosystems to groups such as the public or government policy makers.

Health indicators are used by many governments to track a comparable set of health measurements to compare each other’s progress and identify trends that need attention.

A number of New Zealand agencies monitor indicators for their subject area, which all fit together as part of a national New Zealand Sustainability Indicators Project.

## CULTURAL INDICATORS

Cultural Indicators for New Zealand was launched in 2006, a report forming part of the government's Cultural Statistics Program. The indicators include five key themes: engagement in culture, cultural identity, cultural diversity, social cohesion, and economic development. Selected to measure trends and progress within the cultural sector ("the arts"), contribution to New Zealand's economic/social life the indicators also help identify and monitor improvements in cultural wellbeing and inform policy making (Ministry for Culture and Heritage [MCH], 2007).

At the international level, cultural indicators are identified as having an important role for explaining the urgency and scope of indigenous peoples' needs and for advocating to satisfy these needs (Food and Agriculture Organization [FAO], 2007).

## MĀORI CULTURAL INDICATORS

For this study, Māori cultural indicators are measurements linked to Māori people and their shared world view and traditional practices. For example, the number of traditional food gathering sites accessed by a Māori community may be a useful indicator, as are levels of contamination at those sites. Other indicators include numbers of Māori decision makers in a department or how many authorities include Māori frameworks in their process.

## REMEDICATION

Remediation means providing a remedy; environmental remediation deals with the removal of pollution or contaminants from environmental media such as soil, groundwater, sediment, or surface water. A Māori perspective is likely to bring additional areas for remediation — such as when a spiritual component is involved, or an imbalance in relationships with nature. Further discussion of this term is important as a pivotal concept within this study.

## HAZARD

A hazard is a situation which poses a level of threat to life, health, property, or environment. Most hazards are dormant or potential, with only a theoretical risk of harm, however, once a hazard becomes "active," it can create an emergency situation. The spiritual perspective many Māori follow might consider unseen forces as hazards of equal if not higher importance than the physical ones.

## BIOHAZARD

A biological hazard or biohazard is an organism, or substance derived from an organism, that poses a threat to (primarily) human health. This can include medical waste, samples of a micro organism, virus, or toxin (from a biological source) that can affect human health. It can also include substances harmful to animals.

In the traditional Māori world view, biological or living things might come under the domains of *Tane* (forests, flora, and fauna – including people) or *Tangaroa* (water and aquatic life) – metaphysical children of *Papatuanuku* Earth Mother and *Ranginui* Sky Father. How Māori people relate and interact with these entities as distant siblings is a deeper discussion not covered in this study.

## CHEMO HAZARD (CHEMICAL HAZARD)

A chemical hazard arises from contamination with harmful or potentially harmful chemicals. From a Māori perspective, chemicals, although “non-living” things, still have a *mauri* or life force like rocks do. Everything is connected via genealogical relationship with *Papatuanuku*/Earth Mother – *whakapapa* or relatedness connects all things. Problems occur when things are out of balance in their natural relationship with each other. As with the biological classes, deeper discussion about chemicals is not covered in this study.

## NATURAL DISASTER

A natural disaster is the consequence of a natural hazard (e.g., volcanic eruption, earthquake, or landslide) which affects human activities. On the metaphysical level, a natural disaster for some (like a flood), might be considered a sign or response from Mother Nature to correct an imbalance.

## APPENDIX 2 – DISCUSSION STARTER AND SAMPLE QUESTIONS

### MĀORI CULTURAL INDICATORS

For Remediation of Biological/Chemical Hazards and Natural Disasters  
A Master's Thesis Study by Chris Webber

*Questions for participants to ask themselves:*

- **How much do you know about the emergencies and risks of concern to our Māori communities?**
- **Are the various services prepared to deal with the issues that may arise for Māori?**
- **What roles should Māori play in the various scenarios?**

In preparation for challenges ahead, this study is designed to highlight where cultural concerns of Māori may need consideration with regard to Biological and Chemical Hazard response or recovery from Natural Disasters. Please take a moment to consider the following examples and note ideas that may surface around dealing with such incidents.

Does it matter who is making the decisions? What if it was a *runanga* rather than a Council or Health Department? What considerations are there for current stakeholders to consider?

What type of responses might there be such as from *kaumatua/kui*, *kaitiaki*, young parent, child, rural/non-rural, staunch/not staunch and so forth? When does *tikanga*-based response become more/less essential?

Follow the links from [www.angelfire.com/me/manakupu](http://www.angelfire.com/me/manakupu) to see more and follow progress or contact direct – [cwebber@xtra.co.nz](mailto:cwebber@xtra.co.nz) or (0274) 353 755



## SAMPLE INTERVIEW QUESTIONS FOR MĀORI CULTURAL INDICATORS STUDY:

*Kia Ora* - Please refer to the attached information sheet then consider the sample questions below as preparation for your interview (a separate sheet is included for making notes).

OPTION A: (Directed at general Māori Stakeholders)

**Key Question:** “What is important to Māori in dealing with Bio/chemical hazards and natural disasters?”

Example of Potential Subsidiary Question: “What things in these scenarios affect *mauri* and expression of *kaitiakitanga*? Expand on this as necessary.”

OPTION B: (Directed at Generic/Government/Emergency Stakeholder)

**Key Question 1:** “How are issues of importance to Māori incorporated into the way your organization and staff plans for and responds to bio/chemical hazards and natural disasters?”

### 1. Pandemic Influenza

The bird flu mixes with human strains and spreads worldwide, national economies and systems fall over, agencies and workforces get overloaded or stop, supply of goods and services (including food) breaks down, communities struggle on their own, Māori die in great numbers, authorities ban gatherings like *tangi*, bodies are frozen, rebuilding lives takes a while.

#### What if it was less serious?

A new strain of influenza circulates. A lot of people are ill, those at higher risk could die. Agencies place restrictions on gatherings, public places and worksites, advice is issued for communities to follow (like isolate the sick).

### 2. A Toxic Spill in Your River

A tanker of eco-toxic material overturns, chemicals flush through the river system, living things die, some soil is removed near the river banks, warnings are issued against using food sources from watercress, tuna to shellfish in the bay, and the area is otherwise declared safe.

What if the following week the river floods local *papakāinga*, *kai* is gathered for a *hui* or someone raises concerns about downstream *waahi tapu* (sacred sites), *puna wai* (natural springs) or drinking water supplies (bore and river)?

What if the spill was a slow discharge from the sawmill or dump 20 years ago?

### 3. A P-Lab in Your House

Tenants are arrested by police after a P-lab is discovered in the house. The *whanau* moves into the house. Council says get the place decontaminated by specialists (costing thousands) and makes a note on the property file.

What standards do you expect Council to apply before declaring this (or any) house fit to live in?

How can you decide if the *whanau* is at risk before or after the house is cleaned?

How many *whanau* may be living in houses with unacceptable levels of contamination — what should be done?

**Key Question 2: “What information/process would be of most use to your organization and staff to ensure Māori considerations are adequately addressed when dealing with bio/chemical hazards and natural disasters?”**

Example of Potential Subsidiary Question 3 (directed towards a Māori liaison person for an emergency stakeholder): **“How well prepared is your organization and staff to adequately address Māori considerations when dealing with bio/chemical hazards or natural disasters? What else is required to improve the effectiveness of this?”**

Example of a Potential Subsidiary Question 4 (directed towards emergency stakeholder management): **“What commitment(s) does your organization have to the inclusion of Māori considerations in the way it deals with bio/chemical hazards or natural disasters? Please explain (legislative, policy, relationship, best practice, procedures other).”**

OPTION C: (Directed at Māori Environmental Health and Protection Practitioners)

**Key Question 1: Answer OPTIONS A and B above where appropriate.**

**Key Question 2: What kind of resource and information would be of most use in assisting emergency/recovery stakeholders to deal with bio/chemical hazards and natural disasters inclusive of Māori considerations?**

Example of Potential Subsidiary Question 3: **“What indicators/values would be of most practical use in guiding/supporting stakeholder response to these scenarios?”**

**Note: As a participant in this study, you can choose not to answer any question.**

### APPENDIX 3: EPI-TYPE FILTER FOR INDICATORS

<i>Indicators</i>	<i>Stage</i>	<i>E/P/Pa/T</i>	<i>M/A/O</i>	<i>S/O</i>
Availability, resource and skill base of Māori units	1	P	A	O
Application of Māori responsive checklist before engaging with Māori	1	P	A	O
Number of national/local forums to engage Māori	1	P	A	O
Numbers of non-Māori workers using <i>waiata</i> -practice to satisfy professional development credits for Māori responsiveness	1	P	AO	O
Time taken for clean-up/remediation of local environmental incidents	1	EP	AO	O
Evidence of Māori participation/feedback	1	P	M	O
Links to socioeconomic indicators	1	P	MO	O
Evidence of <i>Marae</i> community growth and strength	1	P	M	SO
Presence of <i>kaumatua</i> /other experienced Māori support	1&2	PT	MAO	SO
Local reports of dying species	1&2	E	MO	SO
Number of Māori becoming sick after eating food from traditional sources	1&2	PaP	MO	SO
Māori responsiveness statements within SOPs/other	2	P	AO	O
Incidence of spiritual cleansing carried out	1&2	T	MAO	O
Ability to include cultural process (like <i>karakia</i> )	2	T	A	S
Appropriate timeframes used for community interaction	2	P	A	S
Capacity of agency to deal with cultural indicators	2	P	A	S
Proper regard given for <i>mauri</i> of a resource	2	T	AO	S
Willingness of departmental/ science personnel to accept/value Māori knowledge	2	PT	AO	S
Breaches of <i>tapu</i> /lack of proper regard	2	T	M	S
Prevalence of key community resource people (food gatherers, organizers, “clever-types” etc.)	2	P	M	S
Progression from one state to another of <i>whanau</i> recovery from <i>hara</i> (transgression/bad thing)	2	EPT	M	S
How overloaded people are with other priorities	2	P	MAO	S
Levels of Māori/unit participation in certain processes	2	P	MAO	S
Planning of resources for future capacity	2	P	MAO	S
The ability to sustain selves and <i>manaaki</i> /honour others	2	PT	MO	S
Culturally secure destinations/outcomes	2	T	O	S
Presence of suitably committed agency staff	2	P	A	SO
Tracking personnel (and resource) against the Māori responsiveness ladder	2	PT	AO	SO
Spiritual level of cleansing required	2	T	M	SO
Participation levels from Māori women/mothers	2	PT	MO	SO
Track categories of alert/response/outcome for selected case study areas like <i>mauri</i> impact assessment	2	PT	MO	SO
Legend: E/P/Pa/T = Environment/People/Pathway/ <i>Tikanga</i> -based indicators; M/A/O = Māori/Agency/Outcome-based focus; S/O = Subjective or Objective measurement				

By filtering indicators from the table above, the following are suggested as best indicators to start with for Māori, agency, or outcome focus:

<i>Māori</i>	<i>Agency</i>	<i>Outcome</i>
<i>Environmental-based Indicators</i>		
Local reports of dying species	Time taken for clean-up/re-remediation of local environmental incidents	Time taken for clean-up/remediation of local environmental incidents
		Local reports of dying species
		Number of Māori becoming sick after eating food from traditional sources
<i>People-based Indicators</i>		
Evidence of Māori participation/feedback	Availability, resource and skill base of Māori units	Number of non-Māori workers using <i>waiata</i> -practice to satisfy professional development credits for Māori responsiveness
Links to socioeconomic indicators	Application of Māori responsive checklist before engaging with Māori	Time taken for clean-up/remediation of local environmental incidents
Evidence of <i>Marae</i> community growth and strength	Number of national/local forums to engage Māori	Presence of <i>kaumatua</i> /other experienced Māori support
Number of Māori becoming sick after eating food from traditional sources	Number of non-Māori workers using <i>waiata</i> -practice to satisfy professional development credits for Māori responsiveness	Links to socioeconomic indicators
	Presence of <i>kaumatua</i> /other experienced Māori support	
	Links to socioeconomic indicators	
<i>Pathway-based Indicators</i>		
Number of Māori becoming sick after eating food from traditional sources	Number of Māori becoming sick after eating food from traditional sources	Number of Māori becoming sick after eating food from traditional sources
<i>Tikanga-based Indicators</i>		
Presence of <i>kaumatua</i> /other experienced Māori support	Presence of <i>kaumatua</i> /other experienced Māori support;	Presence of <i>kaumatua</i> /other experienced Māori support;
Incidence of spiritual cleansing carried out (limited data – maybe hospitals)	Incidence of spiritual cleansing carried out (limited data – maybe hospitals)	Incidence of spiritual cleansing carried out (limited data – maybe hospitals)

## GLOSSARY OF TERMS

The following terms and associated meanings are used in this paper and original thesis.

<i>Aotearoa</i>	New Zealand	<i>Ngakau</i>	Heart
<i>Aroha</i>	Love	<i>Paepae</i>	Seating for speakers/ tribal leaders
<i>Atua</i>	God	<i>Pakeha</i>	Non-Māori, European
BoPDHB	Bay of Plenty District Health Board	<i>Pakeke</i>	Adult, mature
DHB	District Health Board	<i>Papakaiinga</i>	Māori housing area
EHO	Environmental Health Officer	<i>Pepeha</i>	Recital of tribal identity
EPI	Environmental Performance Indicator	<i>Pou</i>	Pole, central pillar
<i>Haka</i>	Māori “war dance”	<i>Rahui</i>	Trespass notice, ban
<i>Hapu</i>	Sub-tribe	<i>Rangatahi</i>	Younger generation
<i>Hau</i>	Wind/Breath	<i>Rangatira</i>	Chief
<i>Hau kainga</i>	True Home	<i>Reo</i>	Māori language
<i>Hau kainga</i>	Local people	<i>Rohe</i>	Tribal area
<i>Hinegnaro</i>	Mind	<i>Runanga</i>	Māori body, assembly
Holistic	Whole of system view	Stakeholder	Interested party
HPO	Health Protection Officer	<i>Taiao</i>	Environment
<i>Hui</i>	Meeting	<i>Tangi(hanga)</i>	Funeral, grieving process
<i>Iwi</i>	Tribe	<i>Taonga</i>	Treasure
<i>Kaha</i>	Strong	<i>Tapu</i>	Sacred/set aside
<i>Kai</i>	Food	<i>Tauiwi</i>	Settler, foreigner, non- Māori
<i>Kainga</i>	House	<i>Tikanga Māori</i>	Māori protocols
<i>Kaitiaki(tanga)</i>	Guardian(ship)	<i>Tinana</i>	Physical body
<i>Kanohi</i>	Face	<i>Tino</i>	Self-determination
<i>Kaupapa</i>	Subject	<i>Rangatiratanga</i>	
<i>Kawa</i>	Tribal etiquette or rules of behaviour	<i>Tohu</i>	Sign
<i>Kete</i>	Flax basket	<i>Tohunga</i>	Expert
<i>Kohanga Reo</i>	Māori “language nest” early childcare centre	<i>Tuakana</i>	Elder sibling
<i>Kotahitanga</i>	Unity	<i>Tupapaku</i>	Corpse
<i>Mahi</i>	Work	<i>Tupuna</i>	Ancestor
<i>Mahinga Kai</i>	Food gathering	<i>Urupa</i>	Cemetery
<i>Mai rano</i>	From long ago	<i>Waahi Tapu</i>	Sacred place
<i>Maia</i>	Brave	<i>Waiata</i>	Song
<i>Mana</i>	Authority/prestige	<i>Waiora</i>	“Water of life,” spiritual/ holistic wellbeing
<i>Manaaki</i>	Hospitality	<i>Wairua</i>	Spirit
<i>Manawanui</i>	Stout-hearted	<i>Whakapapa</i>	Relatedness, genealogy
Māoridom	Māori society	<i>Whakatipuranga</i>	Growth
<i>Marae</i>	Meeting grounds	<i>Whanau</i>	Family
<i>Matauranga</i>	Knowledge	<i>Whanaungatanga</i>	Relationship, relatedness
<i>Mauri</i>	Indicator of “life force”	<i>Whenua</i>	Land

**Chris Webber** was New Zealand's first specially recruited Māori Health Protection Officer, recruited in 1999. Like the Māori health inspectors a century prior, his focus on ground-breaking indigenous approaches to the work produced case studies, indigenous exchanges, and discussion documents to promote development of a Māori and indigenous environmental health sector. Now an independent consultant, he gained with distinction an Environmental Health Master in Philosophy degree in 2010 and continues as a leader in Māori public health, workforce, and community development.

Chris is a previous trainer of Māori journalists, policy analyst, and Māori education advisor, having served on numerous tribal, community, and government boards in the health, social services, and community development sectors. As a network broker he has used Web-based tools to connect and facilitate numerous organizations and communities of interest. He is currently deputy chair of Te Rau Matatini Trust, New Zealand's largest national Māori health workforce development organization and director/consultant for several companies and trusts.

As a descendant of tribal chiefs of Kapiti Island, in 2011 Chris is embarking on a PhD doctorate in indigenous environmental health and development, having founded the Kapiti Area Research Unit as an indigenous research base on tribal lands at Kapiti Island (indigenous collaborations welcome).

[WebberNZ@gmail.com](mailto:WebberNZ@gmail.com)