

From Tapu to Noa - Māori cultural views on biowastes management: a focus on biosolids



Photograph courtesy of Te Rūnanga o Ngāi Tahu

March 2016

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Peer reviewed by Tina Ngata and Morry Black



Centre for Integrated Biowaste Research

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EXECUTIVE SUMMARY

Tapu and noa are key cultural constructs that were central to traditional Māori society, and continue to inform thinking and practice in Māori society today. The intent of this document is to provide some insight, generic language and frameworks about how these concepts might be considered in biowaste management – with a particular focus on biosolids. Importantly, this is to guide non-Māori towards knowing how to ask the right questions in their conversations and engagement with local hapū and Iwi. The report is based upon qualitative research and community engagement work undertaken by the CIBR¹ programme to explore the social and cultural feasibility of the beneficial reuse of biosolids² and effluent from municipal and smaller scale on-site waste and wastewater treatment systems.

A concise definition of tapu and noa is difficult for a number of reasons; however, the simple and limited definition of tapu and noa given below will provide a common point of reference:

- Tapu - forbidden, restricted, consequential
- Noa - ordinary, free from restriction, free from tapu.

Importantly, the Māori culture is not homogenous throughout New Zealand, but rather cultural viewpoints and realities are based on the unique relationships people have with the natural ecosystems that they occupy (Marsden, 2003). Furthermore, tapu and noa should not be considered in isolation from other cultural principles, including mana, for a more complete understanding of the greater cultural landscape. Therefore, this document does not capture the diversity of localised cultural concepts, or their depth, complexity or interconnectedness. Nor does it provide a substitute to consult and talk with relevant local Māori – the real experts.

Here the application of the concepts of tapu and noa to human biowastes (biosolids) has been explored using explanations and examples of tapu and noa and a model of how objects of tapu interact and interface with each other as proposed by Shirres (1982, 1996). The general discussion of these concepts has benefited from the insights given by various Māori communities that CIBR has collaborated with on the issue of biowaste management.

Tapu and noa are inextricably linked to a suite of other cultural values that inform a complex philosophical and spiritual framework within Te Ao Māori. When located alongside in-depth place-based knowledge of local environments, these conceptual frameworks activate traditional and contemporary knowledge, and provide a powerful process for managing a wide range of activities, including how people oversee and interact with their local environments and each other.

¹ The Centre for Integrated Biowaste Research (CIBR) is a virtual centre, combining the expertise of 8 New Zealand research institutes, universities and research partners. Led by the Institute of Environmental Science and Research (ESR), it brings together a multi-disciplinary team of scientists and researchers from ESR, Scion, Cawthron Institute, Landcare Research, Lincoln University, Lowe Environmental Impact, Northcott Research Consultants Ltd. and Kukupa Research Ltd. CIBR aims to facilitate more sustainable options for reusing biowaste (organic waste) by building greater understanding of the environmental risks and benefits of applying biowastes to land.

² Biosolids are carbon-rich and contain valuable nutrients, but may contain a range of micro-contaminants such as heavy metals, pathogens, pharmaceuticals and personal care products.

Accounting for tapu and noa in an organisation's approach to natural resource issues like biowaste management can be facilitated by following some simple steps:

1. Develop a long-term relationship with the mandated mana whenua³ organisation for your area. Only they will be able to define what these Māori concepts mean and how they manifest for particular issues.
2. Engage with mana whenua in a meaningful way that is timely, equitable, transparent and reciprocal (see CIBR Engagement Framework report (Baker, et al., 2016) for more detail).
3. Promote and support raising internal capability and capacity of Māori cultural values – but not as a substitute for mana whenua engagement.

³ Mana whenua describes the local hapū within a designated area or district who have sovereignty or mana of that locality that in turn is derived from their connection to ancestral occupation of that area.

1.0 Purpose of Document

This document is designed to support local government staff and engineers in better understanding and incorporating Māori worldviews into biowaste management negotiations and solutions.

New Zealand has unique central and local government drivers for consultation and public engagement. These include the Treaty of Waitangi (1840) which guides partnerships with Iwi for environmental management, the Resource Management Act (1991), the Local Government Act (2002) and the Environmental Protection Authority Act (2011) which outlines processes for stakeholder or community engagement and consultation with affected parties. The increasing number of Treaty of Waitangi Settlement Acts often prescribe the nature of relationships between local government and mana whenua entities, and inform Māori involvement in environment management. Therefore, the relationship between local government and Iwi is especially important⁴ (Allen, et al., 2009). As a Treaty partner, key stakeholder and environmental guardian, Iwi and rūnanga have a very keen interest in being involved in biowaste, water management and environmental issues. Our research has consistently shown that Iwi organisations do not support a ‘flush and forget’ approach that can be typical of ratepayer responses to the issue. Iwi, land trustees, hapū and Māori business owners tend to be very keen to engage with local government on waste and biowaste management issues. They hold extensive knowledge of their local environment and history, along with well-established practices for managing human impacts upon natural resources.

It is helpful for engineers and council staff to understand Māori worldviews. A greater awareness and deeper understanding of cultural values and frameworks will help support more respectful and meaningful conversations about how to best design and manage local biowaste systems, including biosolids and wastewater discharge impacts. These frameworks will support better long-term solutions and co-management approaches for enhanced environmental and biowaste management.

This document discusses cultural frameworks from a generic perspective and at a high-level. We acknowledge that the report does not represent all Māori views on this subject matter and it is not intended to be a definitive source. What these concepts mean in practice can only be defined by mana whenua, as cultural knowledge is always anchored by local definitions that are grounded in local experience. The all-important local explanations of practice and impacts validate the high-level frameworks of tapu and noa, making them more meaningful. Critically, this document does not replace the need for local consultation nor is it designed to impart information to engineers, for example, that will give them ‘the answers’. The intent of this report is to give insight, language and frameworks to help non-Māori to have confidence in asking the right questions in their conversations with local hapū and Iwi.

⁴ Section 6 of the RMA sets out the “Matters of National Importance” that shall be recognised and provided for by all persons exercising functions and powers under the Act and including “the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga”.

2.0 Background – Biowaste and wastewater management in New Zealand

Waste management systems are designed to manage wastes and protect human and community health in the first instance. Historically in New Zealand these systems have been conceptualised, designed and managed as entities that were independent from the surrounding natural environment and ecosystem (The Ministry for the Environment, 2003).

Over the last 30 years, there has been a changing emphasis to focus on treating wastes prior to entry into the natural nutrient and water cycles, with an emerging view that human wastewater systems should be integrated into natural processes, i.e., existing within the natural ecosystem (The Ministry for the Environment, 2003).

Today, control over the management of New Zealand's natural environment is vested with the New Zealand Government and its agencies and local government. The Treaty of Waitangi (1840) and key environmental legislation provide a basis for Māori entities to express their cultural associations and values in the management of natural resources via partnerships, engagement and consultation. How Māori express these values on issues like waste and water is influenced by unique and varied contemporary realities and experience, as well as traditional historical practices from the pre-Treaty era, and post-Treaty encounters with colonial politics and changing land-use. These multi-layered experiences affect how the conceptual frameworks and values are manifest and expressed – further reinforcing the fundamental importance of consultation and meaningful engagement to explore and evaluate the different interpretations of tapu and noa.

This report is based upon qualitative research and community engagement work under the Centre for Integrated Biowaste Research (CIBR) programme to explore the social and cultural feasibility of the beneficial reuse of biosolids and effluent from municipal and smaller scale on-site waste and wastewater treatment systems. The research has focussed on biosolids (treated or stabilised municipal sewage sludge), with a broader orientation to other organic wastes including greenwaste, food, wood, paper, and agricultural waste streams and other materials.

In a number of New Zealand communities, the water from municipal wastewater treatment plants (WWTPs) has typically been discharged to rivers and waterways. The treatment ponds are dredged when they become full or when the sludge level impedes pond performance, and the sludge is commonly stockpiled and/or landfilled. Both at municipal scale and for on-site wastewater treatment, there is increasing momentum to seek solutions that utilise land application in the discharge of the treated wastewater and its solid components.

Across New Zealand, many of the resource consents under the Resource Management Act 1991 (RMA) for local wastewater treatment plants are nearing expiry, requiring the lodgement of applications for new consents. The land application of sludge/biosolids also requires a separate resource consent. For district and municipal waste water treatment plants (WWTPs) the preparation of new resource consent applications will typically require a consultation process to identify issues, concerns and the potential effects that the discharges may have on potentially affected parties and key stakeholders. This presents both challenges and opportunities for local government and communities.

This report draws upon qualitative interview data and fieldwork, particularly with the Mōkai community near Taupō, and from participants involved in local government within the Rotorua and Taupō region. The information presented here also builds on formative research undertaken by members of CIBR including a comprehensive survey of members of Ngāi Tahu (Pauling & Ataria, 2010) plus hui and workshops for the CIBR programme involving

representatives from the Kaikōura, Taupō and Mōkai Māori communities. We have also utilised historical records accessed from the National Archives.

3.0 Understanding Tapu and Noa as concepts

Tapu and noa are fundamental traditional constructs in Māori philosophy and spirituality that once governed the societal infrastructure and continue to have application and influence in contemporary Māori society. These terms are generally well known amongst New Zealanders, but they tend to be based on superficial understandings. In mainstream Pākehā culture, there is limited awareness of the extent to which the customs surrounding tapu and noa affected traditional Māori life. There is a general lack of appreciation and deeper understanding of how these concepts continue to guide Māori thinking, process and practice today.

A concise definition of these concepts is difficult because:

- a) There are obvious difficulties in maintaining the integrity and meaning of complex philosophies and concepts when translating across cultural boundaries;
- b) There are a broad range of meanings and interpretations of tapu and noa that are dependent on the context in which they are being used, and the relationship with other traditional frameworks;
- c) Māori culture has spatial and place-based nuances – locally based knowledge rather than national uniformity; and
- d) The manifestation of cultural concepts today is affected by multiple societal influences and experiences.

However, for the purposes of this report there are some generic understandings that can provide a useful starting point.

3.1 Tapu

This word is often used to convey the meaning 'sacred'. However, the words 'prohibited', 'forbidden', 'special', 'not ordinary' and 'to be set apart' convey a broader definition that encompasses the attributes of tapu. All things are considered to possess tapu.

Early ethnographers and academics wrote extensively on tapu. Despite the obvious Western cultural lens through which they were interpreting this custom, there are some useful observations. Like many first principles in Māori culture, there is the conviction that tapu is descended from the realm of the Atua (deity) and therefore tapu encompasses all of the extraordinary powers to create and influence inherent to them (Barlow, 1991). This deeply religious connotation coupled with an unyielding commitment to and belief in the power of that spirituality is why tapu was such a powerful instrument in traditional society (Harrison in Benton, et al., 2013 :410) and continues today. This acknowledgement of tapu as being derived from the Atua meant that any deliberate neglect of the 'laws of tapu', even accidental or brought about by the act of another person, incites the anger of the deity, resulting in consequences to the transgressor and/or their kin group (Shortland, 1882) at the hands of the gods or otherwise at the hands of members of the tribe. A breach of 'tapu' was tantamount to committing a hara (violation) and carried with it severe penalties – including death, as was the case with the French explorer Marion du Fresne who fished in an area regarded as tapu (Kelly, 1951).

A pragmatic assessment of tapu was offered by Waddy in his Master of Law thesis in 1927 (in Benton et al., 2013:415) who said:

“Compared with some of our modern practices – legal, social and hygienic – it seems to have been constructed upon the keystone of common sense and expediency... there was always good reason underlying the tapu.”

This pragmatic characteristic of tapu has real intrinsic value in a contemporary decision-making context – especially when this concerns natural resource management.

Tapu can also exist for a period of time, for example a rāhui (closure or ban) to temporarily restrict the people associating with a natural resource, e.g., a beach or collecting kai moana (sea food) from a specific area or location. This might be in respect of a recent accident or drowning, or to help manage overfishing or seasonal pressures on a resource. In this example, tapu provides a means of control over an activity or resource and can be understood as quite a practical and prescriptive response that can respectfully address spiritual dimensions in grieving or bereavement, and in practically managing scarce or fluctuating resources to protect environmental and human health. Tapu can have temporal and fluxing dimensions, whereby time and timing are important determinants in governing or signalling a transition to unrestricted practice. Therefore, this also positions tapu as a transitional concept in supporting ritual and practice to help mediate between the unseen and spiritual world of Atua and the practical world of people and their relationships to the material environment.

Tapu can also have an intrinsic or material quality expressed as a more permanent exercise of tikanga or protocol. For example, a burial ground is always tapu and there is always a strict protocol for behaviour whereby eating is forbidden, and washing hands on exit from an urupā (cemetery) is required. A geyser for example, may be deemed in a more permanent state of tapu, with the effect of protecting human health and exposure to an unpredictable geological hazard of scalding mud or explosive water.

Just focusing on the practical aspects would be to miss other important aspects of tapu. Tapu can also exist as a spiritual power with mysterious and unknown dimensions, including the uncertainties, chance and complex causative relationships invoked within complex metaphysical domains. Notions of consequence, retribution and discretionary capacities for forgiveness may exist as aspects of these religious dimensions. In this context, tapu is built upon intricate understandings of complex spiritual and metaphysical relationships between people, flora, fauna, whenua and environment that are located in foundational concepts of Māoridom – such as mauri, whakapapa and mana.

Shirres (1996) provides an in-depth analysis that is useful for this discourse on tapu. Specifically he refers to the “extension of tapu” which is a consequence of all things possessing tapu, but that tapu is not equal in all things. This implies that the tapu of separate objects does not exist in isolation, and more importantly different aspects or levels of tapu will interact with each other resulting in outcomes that are either constructive or destructive in nature (see Figure 1). Recognising this, Māori developed a series of controls and processes that were very prescriptive and designed for the sole purpose of achieving specific desired outcomes and avoiding what were often drastic consequences. Tapu provides a conduit for the material world to exercise some control and protection in managing intrinsic and unknown qualities, and complex interactions. The processes for deliberately making people or objects noa are an example of this (see Figure 1).

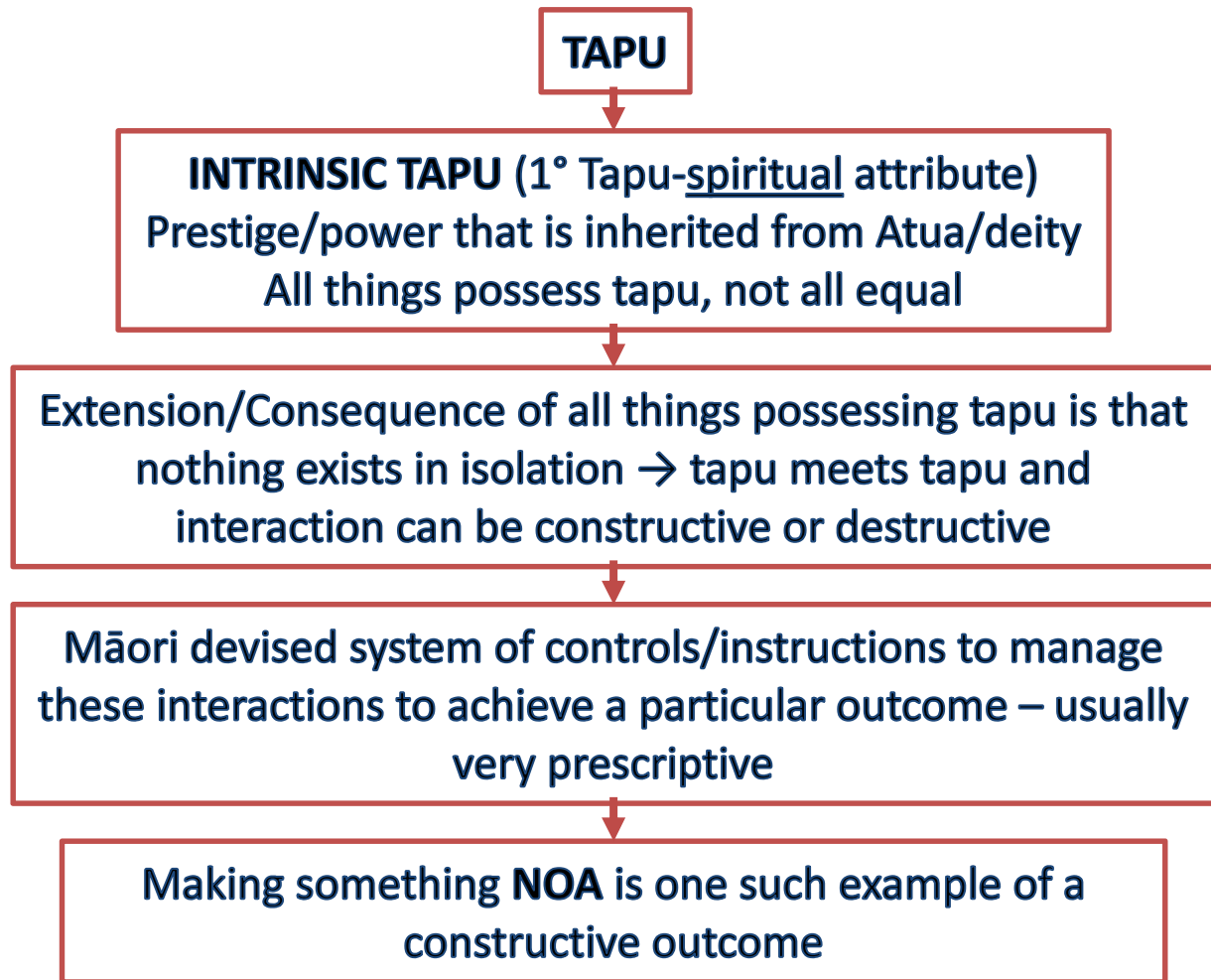


Figure 1. Tapu as defined by Shirres (1996). At the top of this diagram are the intrinsic and spiritual aspects at essence of tapu, as well as the notions of consequence and interaction. The lower sections depict the more practical aspects of tapu as a system of controls to manage interactions, as well as the transition to noa.

3.2 Noa

Noa can be seen as the antithesis of tapu, describing the state of a place, resource or activity that is deemed ordinary or safe, and not subject to control. It is a stative verb⁵ and adverb⁶ denoting 'freedom from restriction' or 'uncertainty', 'indefiniteness', 'randomness' (Benton et al., 2013:266). That something deemed 'ordinary and safe' is also bestowed with 'randomness' and 'uncertainty' seems contradictory, hinting perhaps at the flux and tension between tapu and noa as permeable and entwined. This definition of noa makes clear the inescapable power and intrinsic state of tapu. Similarly the strength of tapu as a practical material mechanism to control the randomness and uncertainty that is within noa, and the realities of living with chance, change and low level risk in everyday life.

⁵ Verbs that express a state rather than an action. They usually relate to thoughts, emotions, relationships, senses, states of being and measurements
<http://dictionary.cambridge.org/dictionary/english/stative-verb>.

⁶ A word or phrase that modifies the meaning of an adjective, verb, or other adverb, expressing manner, place, time, or degree (e.g., gently, here, now, very)
<http://dictionary.cambridge.org/dictionary/english/adverb>.

The complexity in understanding tapu and noa as inter-relational concepts strengthens our key message of the need for guidance from local mana whenua in determining the appropriate interpretation and application of these concepts. In this respect, tapu and noa should not be considered in isolation from other fundamental cultural concepts.

4.0 Tapu and Noa should not be considered in isolation from other cultural principles

Tapu and noa are specific cultural understandings built upon complex and interrelated relationships between people, flora, fauna, whenua and the wider spiritual and metaphysical environment. Other foundational concepts of Māoridom – such as mana, utu, mauri, whakapapa and manaaki inform the expression and understanding of tapu and noa under different contexts (see Figure 2).

Whakapapa is the genealogy of family and interconnection, as well as applying to scientific genus, geographical features and species of flora and fauna⁷. Mauri describes the intrinsic life-force or health of all living beings, including the quality of ecosystems, water, air and earth. Mana is a concept of value, prestige and integrity of an entity or environment, and is discussed in more detail below. Manaaki is to care for and show respect. Utu provides for the concept of revenge or reciprocal action or obligation. These are very limited and simple definitions of complex cultural frameworks. The balancing and appraising of tapu and noa in relation to these important multifaceted concepts helps inform tikanga as protocol that guides appropriate or best practice (see Figure 2).

4.1 Mana

Mana, more than any other Māori value, is intimately connected with tapu and noa. Therefore, a brief introduction to this concept is warranted to provide important contextual information about tapu and noa.

Mana is defined in the Williams Dictionary of the Māori Language as authority, control, influence, prestige, and power on the one hand, and psychic force on the other (Williams & New Zealand Advisory Committee on the Teaching of the Māori Language, 2000). Boast, et al. (1999) define three aspects of mana:

1. Mana Atua – power derived from the deity;
2. Mana tupuna – power handed down from one's ancestors; and
3. Mana tangata – authority derived from personal attributes.

Mana Atua and its association with deity reinforces the tapu nature of this form of mana, which in turn necessitated strict rules and processes around those who were imbued with and bore the mantle of mana Atua (New Zealand Law Commission, 2001:35) – many of whom were chosen to fulfil leadership or chiefly roles ((Williams, 1988:12).

⁷ (see Wai 262 at https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_68356606/KoAotearoaTeneiTT2Vol2W.pdf).

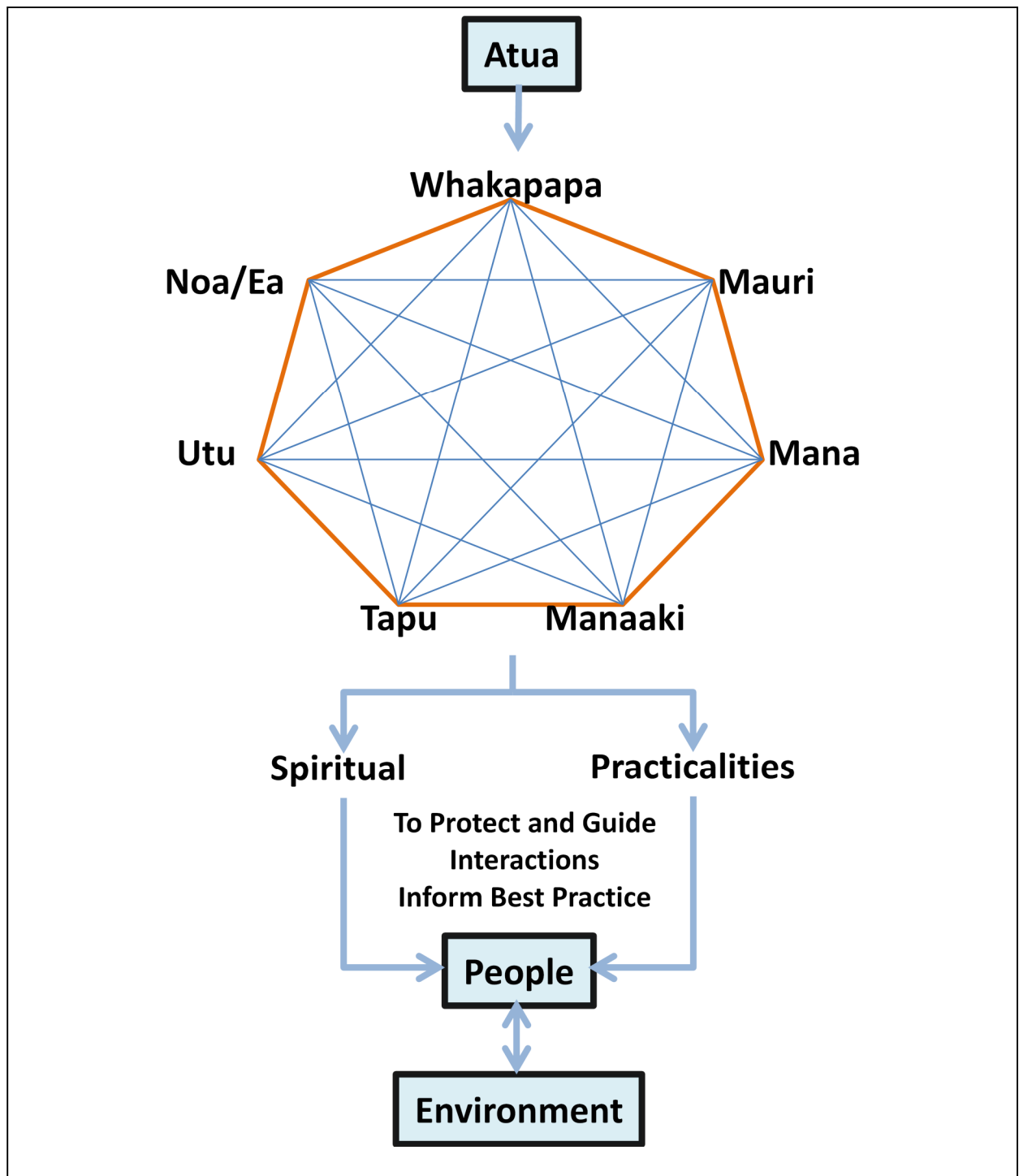


Figure 2. The inter-related values framework showing the complex interactions of Māori fundamental cultural concepts and how they manifest as a guide to inform best practice interactions between people-people and people-environment.

Mana tupuna is authority that is acquired from birth as mana that is passed down from your ancestors. The matāmua (the eldest sibling, or first born male child in some Iwi) received a greater endowment of mana tupuna that would then diminish with each sibling. There is, therefore, an association of seniority in whakapapa (genealogy) with leadership roles and responsibilities (New Zealand Law Commission, 2001:33). However, this quality alone did not always guarantee that leadership would be maintained and often depended on mana tangata.

Mana tangata is mana that is assigned/removed by a person/people to an individual. Therefore, this form of mana can be accumulated or diminished through a person's actions or as a result of others' actions to them, e.g., feats of bravery, skill or knowledge or conversely cowardice or breaching tapu. Mana tangata allowed for class mobility and was often judged not from the perspective of personal achievement, but rather the ability to benefit the collective (Durie, 1994:6).

5.0 Tapu and Noa and Human Biowastes

The rationale for use of karakia and other customs associated with the separation of various types of human waste in the living arrangements of a traditional Māori village was passed from one generation to the next through archetypal stories of prominent ancestors such Hema, Tawhaki, Rata and Hina.

These ancestors feature in the tribal lore of many areas regarding the disposal of faeces (Hema), construction of paepae-hamuti or toilet facilities (Tawhaki), the use of toilet waste for certain ritual purposes (Rata), and protocols for handling menstrual fluids (Hina).

Traditional stories about other ancestors like Tamaiwaho – who helped bring knowledge of healing and medicinal plants to the world - also highlight the potential consequences for human health and wellbeing if tikanga is not followed when managing the various types of human waste."

The relationship of human biowaste, or biosolids, and the environment has historically been viewed by Māori through this inter-related values framework (Figure 2). Tapu has been a principal value that has informed and underpinned well-established practices for managing human waste. Shirres' commentary (Shirres, 1996) on tapu provides a helpful framework that has been extrapolated and applied to biosolids in order to derive one view about how tapu relates to this waste stream.

All humans possess tapu, the prestige/power that is inherited from the Atua, and are therefore very tapu. This spiritual tapu logically extends to human body parts and waste products that are produced and excreted by humans that are, by association, also very tapu (see Figure 3). This elevated tapu state demands that prescriptive procedures and processes are implemented to avoid instances of extension/consequence where the tapu associated with biosolids creates a destructive outcome when it interacts with tapu from another entity/thing. Therefore, rituals and practices were established to mediate between the spiritual dimensions (world of the Atua) and the practical world of people and their relationships to the material environment for positive outcomes: protection of human and environmental tapu.

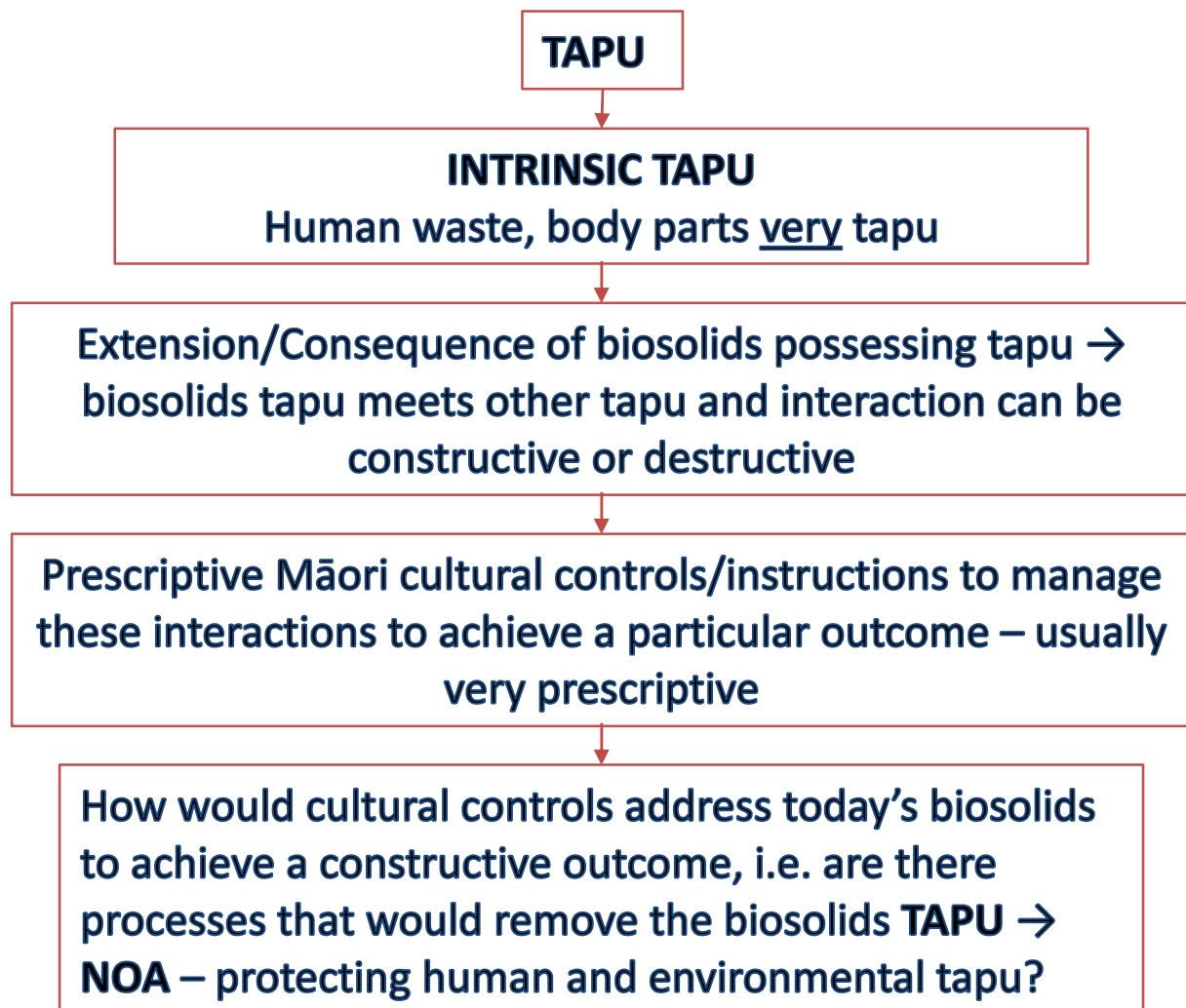


Figure 3. Tapu, noa and biosolids based on Shirres (1996).

Traditionally human waste management practice was heavily influenced by local environment. Whilst there was variability across regions, Iwi and hapū, some generic practices have been cited and drawn from interviews.

Spatial separation and designation of areas specifically for waste (e.g., human waste like faeces, urine and menstrual waste etc. and other activities like bathing, food waste etc.) from significant places (e.g., food growing and harvesting, food preparation and the collection of drinking water), activities and people was key. Traditionally this has been done by the separation of toilet and kitchen or living zones within a marae settlement, being mindful of land slope and run off in locating latrines, or by demarcating different zones for bathing, kaimoana, water collection along a river to minimise the effects within a catchment area. There have also typically been specific practices for dealing with death and illness that are based on separation as a means of control.

The notion of tapu and noa as being transitory, introduces the prospect that things deemed tapu could potentially change their spiritual state over time – assuming that the requirements of time, a detailed knowledge of the composition of the waste stream and the appropriate cultural and management process have all been satisfied. Although arguably not as mainstream as separation, there are some accounts of latrine sites, over time, becoming sites for productive gardens, or where human waste is applied to areas later used to grow kai.

However, whether this was intentional change of land use for productive crop growth, or reflected a change in ownership is not clear in all cases.

6.0 Contemporary Expression and Manifestation of Tapu and Noa

For the most part we have focused on providing a generic description of the traditional concepts of tapu and noa, and showing how these concepts were applied to biowaste (specifically biosolids) management. The reality for Māori in contemporary society is very different. Erosion of traditional constructs is widespread, resulting from the systematic undermining of Māori culture from multiple sources. Colonisation has seen Māori less able to exercise influence in local government and politics, although this is changing rapidly with Treaty-based legislation and the changing power dynamics following Treaty settlement.

The growing political and economic capital of Iwi and Māori organisations make it even more important for local government to respond to, engage, and involve local mana whenua in decision making. Ensuring that Māori values are reflected in robust co-governance and partnership arrangements for managing local resources, biowaste and the environment is key to local and regional infrastructure and development.

Modern reticulated sewage and wastewater treatment raises entirely new challenges of scale and the ability to exercise traditional controls of tapu and noa. Designed to facilitate effective and timely removal of hazardous waste away from built up areas, these systems commit communities to a specific model of treatment reliant on existing infrastructure. While these systems are effective, management of them could be improved to meet cultural concerns. For example, hospital, mortuary and menstrual waste (spiritual tapu associated with body parts or bodily functions) are substances entering the wastewater system that present considerable cultural challenges for some hapū in being assured that the municipal treatment processes can adequately perform a transition from tapu to noa. Discussion around these aspects will often highlight differences and tensions in traditional Māori values and Pākehā concepts of treatment and purity.

The diagram below (see Figure 4) illustrates some different forces or trajectories that influence how tapu or noa may be expressed in response to the issue of biosolids management. However, it is highly likely that the place base; community demographic (rural or urban); the strength of traditional knowledge and power base; and the evolution of governance structures and resources following Treaty settlements are all factors that may influence the strength and range of views on the transition of tapu to noa and the exercise of cultural management frameworks for many natural resource issues. As such local government needs to be cognisant of these factors when determining what the most appropriate modes of engagement with Māori are. Furthermore efforts to empower a local Māori cultural voice on these issues would be beneficial from a decision-making perspective and from an organisational relationship perspective.

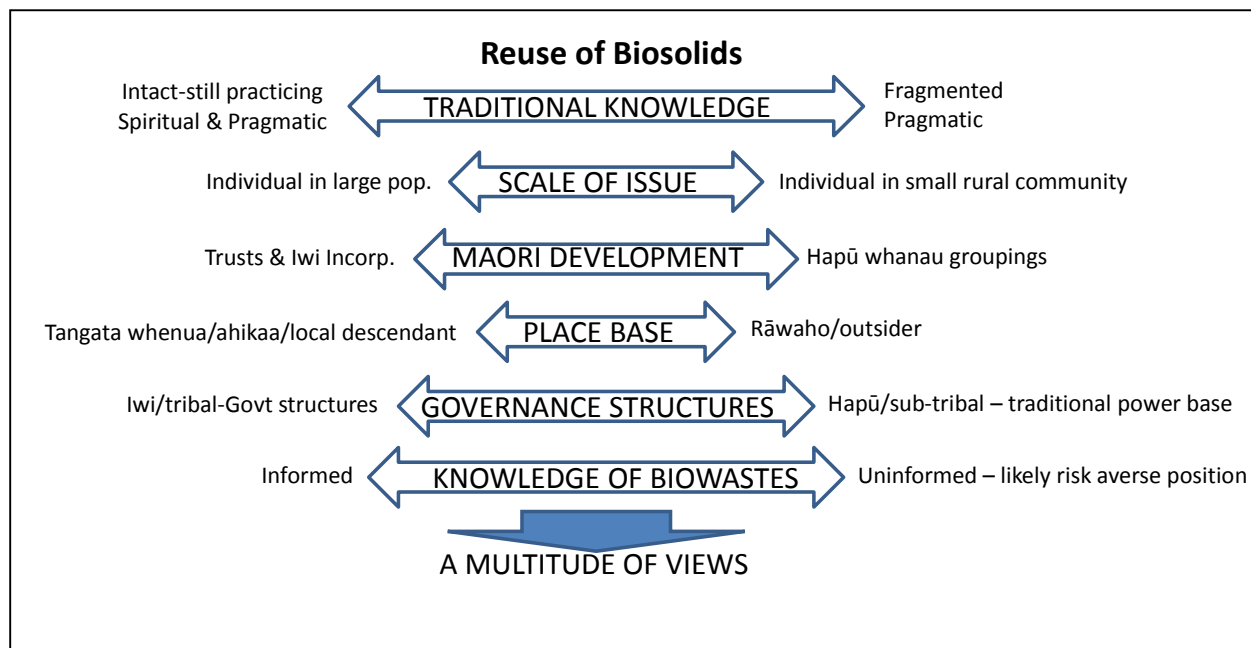


Figure 4. Contemporary influences and realities that inform the expression of Māori culture and practice.

The CIBR programme has developed a Community Engagement Framework for Biowastes (Baker et al., 2016) in recognition of the need for solutions that recognise complex social and environmental relationships, and consider the latent and cumulative environmental effects that may occur at the catchment or regional scale. The framework is designed to guide engineers and council staff in consultation processes with their community, and to ensure that multiple viewpoints can be addressed in planning and co-management of the environment. Use of this framework can help ensure meaningful dialogue/effective engagement with local hapū, Iwi and other Māori entities. Importantly the process can assist in building shared understanding between different stakeholders, strengthen council and community relationships, and build greater trust and confidence in the decision making process.

It is also important to contrast the key differences between traditional waste (including human waste) and contemporary waste streams when considering the application of tapu and noa to biosolids waste. The most striking differentiation relates to a clear knowledge of what constitutes the waste stream – and more importantly the ability to control what is put into this waste stream, i.e. maintain separation. Traditional Māori waste management processes ensured a high level of compliance around what was disposed of and when. This commitment would in turn create confidence and surety in the composition of the waste and therefore reinforce appropriate management is followed, e.g., middens, wood waste from carvings and materials associated with menstruation.

This is impossible to achieve with modern reticulated systems that process wastes from multiple sources. There is less ability to control and be certain of what goes into the system, the treatment processes involved, more diverse cultural practices, increased volumes and an ability to transport waste to other locations. Another factor is the aging waste infrastructure whose capacity to deal with peak loads and maintain clear separation between different waste sources (stormwater, sewage and tradewastes) is questionable. Another key distinction lies in the prevalence and proliferation of chemicals that are in use in contemporary society. In a passage from a Ngā Kaihautū Tikanga Taiao (Māori Advisory Committee to the Board of the Environmental Protection Authority) report to an application under section 28 of the Hazardous Substances and New Organisms Act (1996) to import baits containing difethialone, a

hazardous substance that will be used as a vertebrate toxic agent, the issue of tapu and noa is discussed in relation to chemical persistence:

“Many Māori consider that within the realms of Papatūānuku and Ranginui there exist a range of established processes and relationships that continuously cycle chemicals through the spiritual states of tapu (restricted state) and noa (relaxed or normalised state). In a scientific context these processes could be termed bio- and physico-chemical transformation which acts to breakdown and modify chemical compounds to basic building blocks for other uses or re-partitioning back into the environment. Compounds that have been synthesised with properties that convey resistance to these natural processes are often met with opposition – particularly if their intended use involves direct deployment into the environment or at some point during the life cycle of these products environmental exposure occurs.” (Ngā Kaihautū Tikanga Taiao, 2012).

7.0 Co-management to Reflect Traditional and Contemporary Insights

We explored the meaning of tapu and noa, as well as tikanga for wastewater treatment in contemporary life, in interviews with Māori business owners, kuia and kaumatua for our CIBR project work. These revealed that:

- Māori have a range of views about land application and beneficial reuse of wastewater and biosolids.
- Overall there was a strong sense of ownership of the problem and a view that good waste management was an integral part of exercising kaitiakitanga or stewardship of the environment.
- There are varying degrees of cultural/spiritual knowledge, but many are cautious about beneficial reuse within the food chain. Human health was mentioned as a concern, especially with new chemicals and pharmaceuticals. Some expressed ‘not feeling comfortable’ as a way of articulating how use in the food chain sat uneasily within the frameworks of cultural knowledge and practice. There are also concerns about mortuary and hospital waste, and some would be more open to beneficial reuse options if local government could divert these wastes. Menstrual waste was also a concern for some, but this input was recognised as more difficult to control in contemporary society. Keeping human waste and run off away from sacred places such as the urupā had continued importance. Some mentioned saying a quiet karakia in performing rituals at the urupā, for burying afterbirth, or in disposing of waste on the marae.
- There was a healthy tension and active reflection between traditional ‘separation’ of human waste from food, and being pragmatic and ‘moving with the times’. Some talked of ‘longdrop’ sites ‘being covered up and don’t go near it’ and ‘not used for anything else’ for 20 plus years. Others shared historical examples of gooseberry bushes for eating being grown on old latrine sites, and a koromiko tree planted on a re-dug latrine site with the leaves used for rongoa to cure stomach cramps. In more contemporary practice some spoke of Uncles that grew beautiful sweet potatoes, but not telling the Aunties that they were being grown in biosolids from the municipal plant.
- Small communities, marae and land trusts were interested in better utilisation of contaminated sites and in exploring how they could manage multiple waste streams (including septic tank waste) on site.

- Māori productive sector businesses, for example, were willing to explore biosolids reuse as 'hypothetical' in future planning for sustainable on-site waste management systems, but they were also concerned about how beneficial reuse might impact on export markets, branding and commercial sensitivities around their food production.
- Proximity was important and there was a localised aspect in thinking about waste and reuse. For example, people would consider reuse and be more inclined to eat foods grown in their own waste from a composting toilet, rather than municipal-scale waste.
- There were concerns about the unknown and knowledge gaps: 'What is in it?' was always the foremost question when the CIBR scientists asked communities about how they might consider pollutants vs. nutrients, and the risks and benefits of reuse.
- Protection of water was a common theme, with land application mostly being preferred as a first option.
- Methods of treatment that employed natural processes like composting and vermicomposting (earthworms) were considered favourably, but concerns remain about the ability of these techniques to treat chemical contaminants (recalcitrant and new and emerging contaminants) and what were appropriate reuse options for the composted product.

Iwi, land trustees, hapū and Māori business owners tend to be very keen to engage with local government on waste and biowaste management issues and reinforces our research data showing that Iwi do not adopt a 'flush and forget' approach that can be typical of ratepayer responses to this issue.

Overall there was a great deal of openness and willingness to carefully consider and weigh up options. Many valued the opportunity to access new scientific information and have constructive conversations about what tapu and noa mean, and importantly how these can inform contemporary practice.

8.0 Conclusion

Traditionally the ability for Māori to exercise local control over the separation and disposal of different biowastes was much easier. Today it is far more difficult to control what goes into the wastewater system and where it is treated and disposed of – especially where households are connected to a reticulated system. This is due to legislative and policy requirements and the complex ethnic composition of New Zealand communities. There is also greater scientific awareness of, and ability to study, complex mixtures of contaminants, such as household pharmaceuticals and emerging contaminants from industry or new consumer product ingredients for personal care and hygiene. Influencing household consumption or behaviours (and/or the formulation of consumer products) to reduce or eliminate the disposal of chemicals of this nature is a key challenge. Likewise an aim of diverting trade, hospital or mortuary biowaste may present interesting challenges and infrastructure costs for local government and rate payers.

Tapu and noa are Māori cultural concepts that operate alongside other concepts and values to inform traditional knowledge and resource management frameworks. There is a breadth of cultural knowledge on the topic of biowaste, biosolids and wastewater management, a willingness and openness to explore new forms of co-management, and an expectation of being involved in decision making. Where this is the case Māori view biowastes and biosolids as something that should be owned and responsibly managed, rather than forgotten about or left to the environment to cope with.

Our biowaste wastewater treatment requires more sophisticated forms of governance, as well as genuine conversations about the limits of our knowledge, what ought to be the limits of our treatment, and how we can best continue to manage human impacts upon the environment.

It is a good time for local government to become more informed and have some meaningful conversations with Iwi, rūnanga and local Māori land owners about long-term planning and co-management of the environment, water and biowaste. The steps toward incorporating Māori values into decision-making are relatively straightforward:

1. Develop a long-term relationship with the mandated mana whenua organisation for your area. Only they will be able to define what these concepts such as tapu and noa mean and how they manifest for any particular issue.
2. Engage with mana whenua in a meaningful way that is timely, equitable, transparent and reciprocal (see CIBR Engagement Framework report (Baker, et al., 2016) for more detail). This is, after all, an increasing Treaty and legislative requirement.
3. Promote and support raising internal capability and capacity of Māori cultural values – but not as a substitute for mana whenua engagement.
4. Some approaches for dealing with different or multiple views might be as straightforward as reviewing a resource consent application with local Māori land owners, or a hui with local hapū at a local marae.
5. Alternately local council could support a series of hui with rūnanga and community to develop a co-management approach for long-term environmental planning.

How well local government embraces these approaches will directly correlate to the degree that the Māori world view is incorporated into decision-making.

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