

**Socially and culturally sustainable biotechnology in
Aotearoa/New Zealand.**

**A report on the social, cultural, religious, and
spiritual dimensions of biotechnology for Māori.**

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Report Summary

This report provides a brief description of the research on the social, cultural, religious and spiritual dimensions of biotechnology for Māori. It is acknowledged that the report only touches the surface to a depth of knowledge Māori people hold that explains social, cultural, religious, and spiritual dimensions that exist in Te Ao Māori, the Māori world, and the relationship to biotechnology. However, the themes and evidence produced in the report inform government, business, universities, and communities that there are some common processes Māori people expect from those who wish to dialogue with them in their communities over scientific issues.

The research shows that dialogue with Māori on the issue pertaining to biotechnology, Genetic Engineering (GE) and Genetic Modification (GM), is mainly driven by government or businesses and largely unknown in the community. The reasons for the drive can be attributed to government fulfilling aspects of the Treaty of Waitangi, adhering to clauses in the Resource Management Act 1991, and working with communities that may be affected by scientific research. It also uncovers some problems associated with research on biotechnology with Māori communities at a time when other pressing issues like the government legislation on the foreshore and seabed dominate discussions. Since this drive to discuss biotechnology, GE, and GM does not come from within Māori communities the control over information dissemination and implementation rest largely with government placing Māori and government at opposite poles because Māori have little knowledge about biotechnology experiments whereas government have a vast knowledge. The report highlights some of these issues and is divided into four sections. A review of literature is given in the first section that provides a Māori perspective on the communication of GE and GM in the Māori communities. Section two describes the method used to gather data and section three highlights the findings. In section four the themes are transformed into recommendations to assist Māori, government, business, local and international communities, understand the Māori position regarding sustainability of social, cultural, religious, and spiritual dimensions of biotechnology for Māori.

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Literature Review

*Ko te manu e kai ana i te miro, nōna te ngahere,
Ko te manu e kai ana i te mātauranga, nōna te ao.*

*The bird that eats the miro belongs to the forest,
The bird that eats from education belongs to the world.*

Introduction

Achieving social and cultural sustainable biotechnology in Aotearoa/New Zealand is no easy feat. Biotechnology is not a term Māori people in Aotearoa/New Zealand use in their everyday language. Neither are the majority of their population involved in scientific experiments as scientist or profit immensely from developments occurring. On the contrary, Māori communities are finding themselves being involved in the developments of biotechnology, genetic engineering (GE), and genetic modification (GM) as predominately subjects of research or clients of medical services. Unfortunately, government bodies like the Royal Commission on Genetic Modification (RCGM) are not prepared at this moment to address Māori submissions on biotechnology, GE, or GM because:

many of the submissions to the Commission focused on the modification of foodstuffs, and stressed that the safety and certainty of bioengineering had yet to be proven. Submissions also raised the issue of Maori spiritual values and the implications of the Treaty of Waitangi for the new technology. The Commission concluded that the existing regulatory bodies were not equipped to deal with the ethical and cultural issues raised, and recommended a separate specialist body to coordinate debate about them. (Human Rights Commission, a, 2005, p. 5).

Equally a hard task to accomplish is reporting on the religious and spiritual dimension of biotechnology to Māori. This is because the Māori communities have become immersed in a range of political debates such as the Treaty of Waitangi, foreshore and seabed, and political leadership. When examining religious or spiritual dimensions the issues that have to be taken in consideration are broad because:

Maori spirituality is an inherent part of tikanga Maori, linking mana Atua, mana whenua and mana tangata. The recognition and protection of tikanga Maori (culture), in accordance with international human rights standards and with the Treaty of Waitangi, therefore cannot be separated from Maori spiritual beliefs. (Human Rights Commission, b, 2005, p. 2).

Therefore, when engaging in dialogue over biotechnology with Māori communities discussions are wide-ranging to incorporate a variety of issues such as Māori spirituality, Māori customs, Māori religious beliefs, and the relationship Māori have to the land and sea.

In communities there are two common cases of gene technology Māori understand have a relationship with biotechnology, the crossing of human and cow genes and pig cells in insulin medication. Hook's (2005) discussions on human genes into non-human species is an example of a debate Māori argued passionately for and against in their communities. "The controversy is not so much about the science as it is about the moral significance of interfering with what to some people represents the very essence of humanity, our genetic material" (Hook, 2005, p. 1). The widely publicised debate over human genetic material being inserted into cows is an example where Māori communities tested moral, cultural, religious, and ethical positions. Many Māori communities considered the crossing of human and animal genes to be adherent and unnatural to the basic order of life. Ormsby (2000) discussions on Genetic Modification (GM) addressed Māori culture in the modern world, a world that had been:

influenced by colonization, the Treaty of Waitangi, the legal system, religion, science and so on. If one was to imagine Māori culture sitting at the hub of a wheel, each of these influences would represent the spokes. The outer rim would form Māori ethics and morals, constantly turning and shaping what society now deems to be acceptable practice. My initial reaction to the human gene inserted in a cow proposal was a mixture of intrigue, admiration and repulsion, and in that order. Within Māoridom there are indications showing an increase in the level of awareness towards genetic modification and, just as important, its application processes. The results of this being that Māori are upping the anti stance. (Ormsby, 2000, p. 8).

In Cram, Pihama, and Philip-Barbara (2000) research with Māori over genetic engineering the majority rejected cloning or transgenic human to animal or human to plant experimentation. Although many communities objected to this type of biotechnology it was an issue that raised dialogue and awareness of the implications biotechnology brings to the Māori people.

Objection to biotechnology was a stance by many groups in Aotearoa/New Zealand. Anti GE and GM groups formed alliances to hinder the applications to conduct scientific experiments involving biotechnology and genetic modification forwarded to government. In principle Māori scholars, scientist, leaders, and communities allied with these groups to strengthen their position on the debates.

From the debates emerged groups representing Māori organisations that supported GE and GM. Arguments coming from Māori no longer represented a traditionalist view only, meaning when Māori entered debates they represented a collective voice, the individual voice desired to be acknowledged. Maintaining a strong anti-GE and GM stance representing a generalised Māori view was challenged when social and economic benefits were mooted from the business sector as a pathway to enhance the lifestyles of people and supported by pro-GE and GM Māori organisations. Individuals came out stating that it was:

ethically wrong to stop a process which [would] further the human race. Spiritually it could stop our potential to be all we can be. Culturally our people have never been one to stand in the shadows. I support GE properly safeguarded and given the potential cures [are] possible. (Bio-Ethic Council, g, 2004, p. 1).

The debates were challenged by Māori scientist and health professionals that explained the benefits. “These benefits include the production of insulin to treat diabetes and cow’s milk containing a synthetic protein gene for the treatment of multiple sclerosis” (Hook, 2005, p. 1).

Literature has provided common themes that have emerged from the Māori communities when issues about biotechnology, GE, and GM are raised. This report discusses four themes: Māori Terminology, Precautionary Stance, Control Mechanism, and Unknown Future. The review provides a broad assessment of Māori dialogue to guide, educate, explain, and invoke critique.

Māori Terminology

A key reason for the limitations to a task that would achieve social and cultural sustainable biotechnology or explain religious and spiritual dimension of

biotechnology for Māori is the scientific terminology. Māori communities visited by government officials, academics, professionals, and consultants trying to educate and explain the relevance of biotechnology to them have been confounded by the scientific language. (Cram et. al., 2000; Smith & Reynolds, 2000; Te Momo, 2005). It became apparent that educating Māori and non-Māori about ways to dialogue with Māori was vital.

This prompted Māori people to draw on their own mātauranga (Māori knowledge) and value system to understand the basis of arguments or interpret the scientific language. Mead (2005) says “as new developments in biotechnology occur, Māori are beginning to engage in discussions concerning the use of these technologies and their effect on tikanga Māori” (p. 1). In his writings Mead links the development of biotechnology with the development of human beings and suggests that tikanga is a “basis to assess these new technologies” (p. 1). Mead applies the term tikanga to the human body to explain the importance for guiding new technical developments because:

Tikanga Māori gives clear cultural guidelines about how we treat one another and how the human body is regarded. Every part of a human person or ira tangata is treated as tapu (sacred) and comes complete with the attributes of that person. Nowadays all body parts, even severed limbs, are buried at the urupā as each body part includes the human gene – it is a part of ira tangata and therefore tapu. As descendants of ira atua, Māori are of an inter-related universe. Tikanga shows that we have to respect all forms of life and take some responsibility as kaitiaki (guardians) over te ao marama (the world of light). (Mead, 2005, p. 1).

Smith and Reynolds (2000) in their writings discuss the change in battles between the Crown and Māori from fighting on the land, then in the courtroom, to be presently in laboratories. The battles in scientific laboratories and patent offices are according to Smith and Reynolds battles of awareness, knowledge, and choices. They call it the “‘new wave of colonisation’, ‘the new biotechnology’, ‘the bio-revolution’ or ‘bio-colonialism’, it is here and it will be with us for a very long time. In a broad sense we are talking about science” (Smith & Reynolds, 2000, p. 2).

In the quest to remain a voice in battles occurring in scientific laboratories and amongst the communities Māori have applied te reo Māori (Māori language) to understand, interpret, and respond to the scientific language that engulfs them.

Māori terms that have arisen from the Māori communities to explain their perspective on biotechnology or the relationship to them are Whakapapa (genealogy), Mauri (life principle), Tikanga (customs), Kaitiakitanga (guardianship, environmentalism), Mana (power, prestige), Manaaki (care for), and Wairua (spirit). These are some of the main Māori terms being voice that hold a lot of meaning and require an in-depth critique. However, whakapapa and mauri are two terms talked about in the following paragraphs to provide a brief explanation of the diverse views Māori take to present their position on an issue using their own ways of communication.

One of the loudest arguments says Smith and Reynolds (2000) against “genetics and biotechnology is coming from our own kaumātua, who are saying very clearly that no one should corrupt or interfere with whakapapa” (p. 2). The kaumātua are adamant that the sanctity and “respect for whakapapa is to be maintained. Both mauri (life principle) and wairua (spirit) of living things are sacred. The responsibility falls on us to protect the legacy of our future generations and this includes the guardianship of whakapapa” (Smith & Reynolds, 2000, p. 2).

Whakapapa has occurred frequently in literature to object to DNA Mapping and Sequencing, Gene Technology, and Cloning. Whakapapa explained by Barlow (1991) is the genealogical descent of all living things and to lie one generation upon another. It relates to everything human, animal, vegetable, mineral, and fish. Whakapapa, Smith and Reynolds (2000) state “is being interfered with when scientists start crossing one species with another” (p. 5). Gibbs (1998) argues that the genetic manipulation of human species is an interference with basic human structure and when translated to a Māori point of view interferes with the whakapapa.

Mauri is believed to contain a physical and powerful life force that exists in every living thing. This life force connects Māori to everything that lives whether it is animal, vegetable, or mineral. “Mauri is a life force. The koru, the way something comes into itself. It’s the individual mystery personified in young children. Human gene transfer will affect the way this mauri is expressed” (Bio Ethic, e, 2004, p. 1).

Cram et. al. (2000) identified three key concepts important to Māori when discussing genetic engineering. The concepts are:

1. all elements of the natural and divine worlds, including humans and genetic material, are related and are linked by the possession of mauri the life force;
2. It is the responsibility of the present generation, as kaitiaki, to protect the mauri of genetic material from defilement or abuse;
3. genetic manipulation may be seen to interfere with the integrity of species and, therefore, may interfere with the mauri of the affected species. (Cram et. al., 2000, p. 13).

The concepts compiled by Cram et. al. (2000) are similar to Gibbs (1998), Smith and Reynolds (2000), and the Bio-Ethics Council (2004). The explanations of Māori terms and the relationship to biotechnology, GE or GM show the diverse positions Māori take on these matters.

Utilising Māori terminology to explain and interpret biotechnology, GE, and GM is crucial to create and understand dialogue. The Māori terms provide a movement towards creating dialogue between Māori, scientist, government and the wider community. Also, stating the terms only is insufficient and a deep interpretation in lay terminology that is understood by Māori communities is required. Relating these terms to beliefs and values are significant to conversing with Māori and an important way to educate Māori and non-Māori in Aotearoa/New Zealand.

Precautionary Stance

Since biotechnology, GE and GM used in DNA Mapping and Sequencing, Gene Technology and Cloning is relatively new the boundaries, limitations, and outcomes are largely unknown. The unknown future of this type of experimentation is a significant reason for Māori to approach biotechnology, GE, and GM with caution. Māori have adopted a precautionary stance whereby they will resist supporting biotechnology initiatives until they are better informed. More importantly Māori seek guarantees that the benefits would be more important than the risks. Adding to this precautionary stance is the debates within Māori communities on the usage of this technology. Groups are asking whether it is:

appropriate for Māori to use this technology? The answer is not a simple yes or no. It is not appropriate because it interferes with the mauri, the life force of the natural world, of which Māori are guardians, but is it appropriate for its

medicinal purposes. Genetic Modification (GM) manipulates the deoxyribonucleic acid (DNA) of cells to produce effects advantageous to humans. Before colonisation Māori were entirely dependent on the environment, shaping their ways and beliefs. Thus the tradition was born that Māori would be kaitiaki, or guardians, of mauri, protecting it from abuse and destruction. However, genetic modification is seen as interfering in the life force of the affected species and because of this many Māori are against genetic modification. They believe each species should be left untouched, the way nature intended. (Boticca, 2002, E2).

The Māori perspective says Jackson (2001) on genetic engineering is that Māori are “opposed to the concept. It is totally in opposition to the philosophy by which we live and to our traditional beliefs” (p. 2). Jamieson (2003) argues, “many Māori object to GE – but the opposition is far from black and white” (p. 1). Her arguments become more colourful when she quotes Ranginui Walker comments on Māori having a heart transplant who says:

when you transplant a Pākeha heart into a Māori, asks writer and academic Ranginui Walker. Does it defile whakapapa? Does it disturb mauri, the life force? Maybe so. And yet, Māori are having transplants. Despite widespread Māori opposition to genetic engineering, Walker suggests that, over time, at least some uses of it may become more acceptable to Māori – just as transplants have. (Jamieson, 2003, p. 1).

Jamieson (2003) discussions on the range of perspectives coming from Māori communities regarding the benefits biotechnology can bring are not supported by prominent Māori organisations. Groups that continue to object to GE include iwi, Māori Women’s Welfare League, Māori Council, National Māori Congress, and the National Organic Organisation Te Waka Kai Ora. Jamieson reports that three common concepts continue to surface amidst the debates, Whakapapa and Mauri (explained on page 8) and Kaitiakitanga that in terms of Māoridom justify their precautionary stance. Kaitiakitanga or guardianship is a role Māori believe they have to fulfil by ensuring the mauri and whakapapa of everything is protected. “Many Māori see GE as interfering with the integrity of mauri and whakapapa, and believe they must assert their kaitiakitanga in order to protect these things from being disturbed” (Jamieson, 2003, p. 1).

Professor Mason Durie, quoted in Massey News (2003), argues that taking a risk management approach within the current debates on GE is not the best way to bring

together the views of Māori and science. Durie's submission to the Royal Commission on GM and ERMA argued that "genetic modification was unacceptable because it contradicted Māori custom and philosophy, or tikanga" (p.1). Massey News (2003) contends that while Māori views are often intuitive:

rejecting genetic modification out of hand, many quite specific criteria focus on cultural and spiritual values. Many concepts raised at the ERMA hearings – concepts such as whakapapa, mana, tapu or mauri (life force) – were at odds with genetic modification, and transgenic research in particular. Yet those concepts, said Professor Durie, underline the close relationship of humans to the natural environment, and such are a "defining quality of the Māori world view". He noted that Māori were opposed to the transgenic sheep proposal and the (now approved) transgenic cow proposal because mixing genetic material between species is an interference with the whakapapa model, and so is a cultural offence. A failed High Court appeal on this second phase found ERMA had "taken into account" the relationship of Māori and their culture and traditions with their spiritual taonga and this was all that was required. (Massey News, 2003, p.1).

The failed high court appeal highlights the hurdles Māori encounter trying to justify to the Crown the reason to prevent GE and GM from proceeding. A political organisation, the Mana Māori Political Party opposed strongly to GE. They were extremely concerned that the Crown would breach the Treaty of Waitangi by failing to "take on board the anti GE views expressed to the Royal Commission by a large number of Māori" (Mana Māori, 2001, p. 1) so their leaders occupied the ERMA building in protest taking an Anti-GE Māori stance (NZ Herald, 2001).

Human Rights Commission (2005) discussions on Māori spirituality (wairuatanga) acknowledges the value of spiritual, cultural, and ethical positions Māori present to support their precautionary stance. The Human Rights Commission reminds all those who have entered the debates on biotechnology, GE, and GM experimentation that Māori have a legal position in the Resource Management Act 1991 and:

in terms of the environment, while the Resource Management Act 1991 provides explicitly only for Maori spiritual beliefs, it provides for 'historic heritage' as a matter of national significance. The Historic Places Act 1993 includes reference to places or areas that possess 'spiritual significance or value', and these must be considered under the Resource Management Act 1991. The issue of equivalent recognition of spiritual significance for all beliefs is, however, a matter for continuing debate. (Human Rights Commission, b, 2005, p. 2).

Therefore, the precautionary stance can be viewed as a positive step for Māori and Aotearoa/New Zealand because it would require government and scientist to tread with caution.

Control Mechanism

Māori continue to struggle within Aotearoa/New Zealand society to assert their right to share control over the land, sea, and air with the Crown (representing the New Zealand government) as tangata whenua. Decisions that impact or affect the natural state of the land, sea, and air Māori state breach Treaty of Waitangi Article II that guaranteed exclusive rights and protection of their land, sea, forest, and taonga. Any advances in biotechnology that endanger or has the intention to cause harm to the natural state of land, sea, forest, and taonga Māori claim the Crown must consult with them and decisions made over these advancements be made collaboratively. Some consultancy groups considered advancements in biotechnology valued Māori culture however submissions to the Royal Commission on Genetic Modification (RCGM) were different and raised issues about:

the exclusion of Maori from decision-making (including decisions about ownership of intellectual property); distrust of transgenics, potential for interfering with whakapapa; and the potential risk to cultural and spiritual well-being posed by biotechnological developments. It is important, however, to recognise that views among Maori are as diverse as those among the population as a whole. (Human Rights Commission, a, 2005, p. 8).

The Treaty of Waitangi is a legal mechanism that declared control over land, sea, forest and taonga to be a partnership between Māori and the Crown. Scientific experiments that are sanctioned by the New Zealand government that compromise the position of Māori in terms of the Treaty of Waitangi must expect protest from Māori. The Treaty of Waitangi forces the Crown to protect and consider the Māori world. Tipene-Matua (2003) says “when articulating their concerns and aspirations about GM biotechnology, Māori almost always cite the Treaty as guaranteeing rights to control what will impact on their well being” (p. 99).

Craig, J., Anderson, S., Clout M., Creese B., Ogden, J., Roberts, M., and Ussher, G.

(2005) argued that government needed to recognise intellectual property rights, and the equity issues. Failure of such recognition led to the:

1993 Mataatua declaration and a claim to the Waitangi Tribunal (Wai 262) seeking recognition, restoration, and protection of Maori cultural and intellectual property rights over flora and fauna. Despite these initiatives and some major legislative advances both internationally and nationally, Maori still remain on the periphery of efforts aimed at the conservation and management of biodiversity. Greater effort is needed to identify and remove the individual and institutional barriers that prevent empowerment of Maori and other community groups in achieving sustainable biodiversity outcomes in Aotearoa/New Zealand. (Craig et. al., 2005, p. 10).

Craig et. al. indicated that control remains in the hands of the government and Māori struggle for recognition.

Six tribes representing iwi in New Zealand lodged the Waitangi Tribunal Claim 262 for recognition and protection of cultural and intellectual heritage rights. The six tribes were Ngāti Kuri, Ngāti Wai, Te Rarawa, Ngāti Kahungunu, Ngāti Porou, and Ngāti Koata. The recognition and protection related to Māori knowledge of indigenous flora and fauna, traditional knowledge, customs and practices that Māori exercised over flora and fauna and:

includes all native species in New Zealand. It includes Māori arts and designs. It includes traditional knowledge, plants, and medicines. It raises concerns in opposition to genetic tampering with DNA structures of native flora and fauna in the sense that Māori have a particular whakapapa or genealogical relationship with the native flora and fauna that is not being respected or understood by science, scientists, and the experiments that are taking place. (Solomon, 2001, p. 2).

“The Wai 262 claim, or the flora and fauna claim, is a reaffirmation by us of the right of tino rangatiratanga. We have the right to protect the flora and fauna within each of our tribal boundaries” (Jackson, 2001, p. 2).

In 1996, the Environmental Risk Management Authority (ERMA) was established under the Hazardous Substances and New Organisms (HSNO) Act. ERMA is charged with the duty to make decisions on applications to import, develop, or field test new organisms; or to import or manufacture hazardous substances to New Zealand. They created an advisory board Nga Kaihautū Tikanga Taiao (NKTT) which is an advisory committee appointed by the Authority to assist them with their

decision on Māori cultural issues. NKTT advises the Authority on issues such as the Treaty of Waitangi, risk approach and aversion to Māori, consultation with Māori and Māori perspectives. NKTT do not represent any specific iwi and have a direct relationship with the Authority than the applicants (ERMA, 2004). The work by NKTT has led to ERMA:

looking at giving more weight to Māori spiritual values when it considers genetic research proposals. The move goes against the concerns of many scientists, who say existing rules on Māori involvement are hampering research. The authority is consulting on ways to better take into account Māori cultural and especially spiritual values in revised policy, due to be issued in June. It suggests among other things, that Māori spiritual concerns about genetic research – even in the absence of any physical or biological risk – could be enough reason to reject research applications. (NZ Herald, 2002, No.8).

Ngāti Wairere a hapū, a tribe from Waikato, argued that changing the genealogy of a species was inherently against their spiritual guardianship. They referred to the mauri or life force of all living species to substantiate their claim. Being in the district where scientific experiments on the insertion of human genes into cows milk where conducted placed their guardianship in immediate danger. They submitted to ERMA and the Royal Commission their objection to this type of experimentation in the district to which their tribal boundaries made them kaitiaki. However, the majority of the decision-makers for ERMA did not feel that their obligation to protect things of value to Māori extended into the spiritual realm. Unfortunately, the majority of ERMA members felt that New Zealand could not risk being outside the mainstream of scientific research:

the Māori advisory committee to ERMA recommended that the application be turned down until the Royal Commission on genetic modification had completed its inquiry. Ngati Wairere and the Wai 262 claimants suggested they put a moratorium on granting any applications for GMO's. But the authority went ahead and granted the application. The tribe appealed the High Court and we are awaiting the decision on that now. (Solomon, 2001, p. 4).

In 2003, the New Zealand government stated they were lifting the GM Moratorium. This action was perceived by Māori groups as breaching Article 2 in the Treaty of Waitangi. Māori attempted to delay the lifting of the GM Moratorium using the Waitangi Tribunal as a vehicle to forward their claim under the Treaty of Waitangi.

Manu Paul, a spokesman for Te Waka Kai Ora, a group of Māori organic growers, said:

an urgent hearing was being sought from the tribunal and he believed it would be this month. Under the treaty, the Government had a duty to protect Māori, but the lifting of the moratorium on genetic modification, due on October 29, was a failure to carry out that duty. The tribunal could only make recommendations, and while Māori could argue that had not been consulted adequately, the Government could argue it had consulted through the Royal Commission on Genetic Modification and changes to the Hazardous Substances and New Organisms Act. (Beston, 2003, p. A6).

It was evident in literature that Māori apply the Treaty of Waitangi and forward grievances to the Waitangi Tribunal as a mechanism to take control over biotechnology experimentation that impact on them and their communities.

Unknown Future

Since large sections of Māori society consider the scientific language to be confounding, resist supporting biotechnology experiments taking a precautionary stance, and are not in control of developments the future to them is unknown. It is this uncertainty that creates objection and resistance in Māori communities. Only a few representatives of tribal groupings welcome experimentation citing the economic benefits to enhance social wellbeing. This has caused those making decisions based on social need and economic benefit for Māori to relax the opposition to GE or GM causing a division in their communities. In the case of Te Arawa and Ngāti Whatua these two tribes found themselves in opposition. An elder from Te Arawa endorsed research that produced a genetically modified pine, however:

Auckland's Ngāti Whatua people are not so sure. Ben Hona, a kaumātua of Rotorua 's Ngāti Whakaue people, led a Te Arawa group which formally handed over genetically modified pine seedlings from Forest Research in Rotorua to HortResearch in Auckland earlier this year. Hona, a member of Forest Research's Māori consultation group Te Aroturuki, is also a kaumātua at Rotorua's Māori Arts and Crafts Institute and says he can see the benefits of GM wood. "I don't have any worries about it," he says. You take our economic situation. I have to go with anything that will lead to a better utilization of our forestry assets. If there is anything that would be of used to my people, well, I would go with it, mainly because there's not a hell of a lot of resources left to us. But a kaumātua of Ngāti Whatua o Orakei, the Auckland group which welcomed the GM pine seedlings to Mt Albert said he did not feel comfortable about the ceremony. "There is a cultural spirituality

about GE that goes against the grain of Māori thinking and Māori philosophy” said Grant Hawke. (Weekend Herald, 2003, p. B5).

Moving from forestry to edible products Cram (2001) proposes a cynical view that GE will be tested on the poorer people. Her position is that GE will be trialled on the less fortunate in Aotearoa/New Zealand in which a large representation will be Māori and Pacific Islander. She contends that with respect to GE:

one of the arguments we make is if this country accepts the genetic engineering of crops and a GE component in food, even with labeling, we know that all those foods that the wealthy don't want are going to be dumped on the most deprived – of who the majority are brown, Māori and Pacific Islanders. We already know that because if you go into these deprived communities and look at the food on the supermarket shelf it's expensive, the meat is bad, the vegie's are dreadful. (Cram, 2001, p. 3).

Tipene-Matua (2000) raises concerns on the future implication of biotechnology, GE or GM. The organisations controlling the future of biotechnology, GE or GM are non-Māori. The affects of this type of development is still in its infancy and relatively an unknown journey:

The long-term impacts of this market to regulate, and the role of ERMA and other watchdog organisations is therefore crucial. The scientific and biotechnology industries have within their grasp tools that may potentially ease much suffering and benefit people globally. The question is: will they use these tools to do so or will it be another cash lolly scramble? (Tipene-Matua, 2000, p. 109).

Cram (2001) positions her arguments in the home. She looks at the vulnerability of Māori who due to their status in society will become the guinea pigs of scientific experimentation. Ultimately, she signals out the item that Māori need 'food' and more importantly cheap food. The growth and cultivation of food Cram singles out to be a danger:

It's not knowing where your food is coming from. There's a belief that you shouldn't be tampering on the genetic level and doing something that is not going to happen naturally. You are interfering with the genealogy of whatever you are tampering with. When you start interfering with the genealogy of something, you are interfering with the spirit of something. When you come from a culture where people believe that everything has a spirit, a life force, when you start tampering with that, there's got to be repercussions in some form, somewhere. (Cram, 2001, p. 7).

Ormsby (2000) provides a range of issues that should concern Māori. He presents arguments from both sides of the fence. He reminds Māori “all iwi are going to be

affected by this scientific approach. They will bare witness to the ushering of new ethics and will need to invert upon their sets of morals” (p. 10). He acknowledges the depth of the debates and the impossible task to address them all. In laymen terms the following comments summarizes the feeling from a large section of Māori:

It’s like the love bug virus. As soon as you open it up, it spreads. The irony is that the love bug caused widespread destruction all because some bugger wanted to have a look. It is not hard to see why ERMA did not want Ngāti Wairere to reinvent the wheel. They wanted to contain the issue in the same manner that they contain and control experiments. They have downplayed the application and made it appear like a small wheel, even though it is a matter of national importance. Māori are not the ones causing the reinvention of wheels. Our world was already cyclic. It does however signal a turning point in the history of our culture and that big wheels keep on turning and proud Māori keep on burning. That’s the nature of the beast. (Ormsby, 2000, p.10).

A strong concern raised in literature was for Māori to protect the future. Māori believe they are guardians of the environment and their decisions have to ensure the future for their mokopuna (grandchildren) is not endangered. Since the future of biotechnology, GE, and GM is unknown they would tread with caution before supporting any experiment.

Conclusion

Sustaining biotechnology in Māori communities requires government, universities, businesses, and the wider community to value the Treaty of Waitangi and Māori culture. Once this is established a process of education can begin so that the Treaty of Waitangi can be acknowledged and crucial developments in Māori communities such as the Waitangi Tribunal Claim 262 are recognised and given weight by the government. This review has shown the following main issues to be important: Māori Terminology, Precautionary Stance, Control Mechanism, and Unknown Future. It provides a snap-shot of the conversation between Māori communities and government and the Māori perspective on some contentious issues.

Interpreting scientific language to Māori Terminology is significant to creating discussions between Māori and non-Māori. Equally important is the ability to deliver this language in a fashion the Māori communities can understand. Therefore,

those charged with the responsibility to dialogue with Māori communities about biotechnology, GE, and GM need to understand Māori concepts like whakapapa, mauri, tikanga, and kaitiakitanga so that they are in a better position to talk with Māori.

Accepting Māori are more than likely to take a Precautionary Stance to any biotechnology, GE or GM in the communities is important. Once this acceptance is acknowledged then Māori are able to explain their Precautionary Stance and steps can be developed to find ways to show them that the benefits of these scientific experimentations outweigh the risks. When this is achieved Māori are more than likely to move from a Precautionary Stance.

Ensuring that Māori participate in the decision making processes of biotechnology, GE, and GM is in alliance with the Treaty of Waitangi. Presently, Māori are aware that the Control Mechanism rest with the government and they are in a disempowered position to make a positive contribution to biotechnology, GE, and GM being delivered in the communities. Unless the issue of control is addressed dialogue between Māori and government would continue to be largely in conflict.

Unfortunately government, scientist, and businesses are unable to guarantee that biotechnology, GE, and GM is beneficial to them. Instead Māori are aware that the economic and political benefits from these types of technology are predominately reaped by government and businesses. Also, the long term affects to the health of patients that have been recipients of technology are unknown. It is these factors that prevent Māori from endorsing it because it has an Unknown Future.

Method

Nāu te rourou nāku te rourou ka ora te tangata.

With your food basket and my food basket we will satisfy the people.

Introduction

Gathering feedback from Māori communities on the social, cultural, religious and spiritual dimensions of biotechnology for Māori requires a cultural and social research approach. Māori Centred Research and Social Research theories were adopted to reflect a cultural and social research method. Both methods produce qualitative data and provide frameworks for participants in the research to construct their realities. These realities are capable of multiplying in any given situation and the frameworks provide guidance on ways to respond to participants. Creswell (1994) contends that a “qualitative researcher needs to report faithfully these realities to rely on voices and interpretations of the informant” (p. 4). To ensure the report was faithful and realities were recorded informal preliminary work was undertaken with Māori communities to build a relationship between them and the researcher. Once the relationship was established the formal process of establishing meetings and interviewing could take place and participants identified.

Māori Centred Research and Social Research theories argue the importance of the researcher to understand the environment being researched. Davidson and Tolich (1999) state “theory without research is mere speculation; research without theory is merely data collection” (p. 17). Therefore creating a research environment where valuing the participants and their knowledge was of great significance that required the researcher to understand Māori language and social research terminology. The researcher had to be able to translate the research initiatives in lay-terms so that the community could understand and commence dialogue. In doing so the realities of Māori participants’ perception of how biotechnology, GE, and GM were received, translated, interpreted, and recorded.

Cunningham and Durie (1998) provided frameworks for researchers conducting or intending to conduct research in Māori communities. In their discussions they separate different types of research with Māori communities: Research Involving Māori, Māori Centred Research, and Kaupapa Māori Research. Research involving Māori was research “where Māori are involved as participants or subjects, or possibly as junior members of a research team; Research where Māori data is sought and analysed; Research where Māori may be trained in contemporary research methods and mainstream analysis” (1998, p. 4). Slightly different was Māori Centred Research to which “Māori are significant participants, and are typically senior members of research teams; Research where a Māori analysis is undertaken and which produces Māori knowledge, albeit measured against mainstream standards for research” (1998, p. 4). However, Kaupapa Māori Research required Māori to be “significant participants, and where the research team is typically all Māori; Research where a Māori analysis is undertaken and which produces Māori knowledge; Research which primarily meets expectations and quality standards set by Māori” (1998, p. 4). The degree of control highlighted by Cunningham and Durie as important factors that signal whether a research is based on Māori knowledge or a modification of Māori knowledge to produce Western knowledge. They contend Māori control over research is exercised in respect of:

- identification of priorities;
- ethical and peer review of methodology and methods;
- leadership of the research team/project;
- determination of standards for quality assessment (for example consultation and dissemination); and
- measurement of results against Māori development goals.

These controls are the equivalent of mainstream controls and should not be seen as additional. Kaupapa Māori research is a formative discipline; this does not mean it is a lesser endeavour. It is distinctly Māori and has developed within certain environmental constraints (Cunningham and Durie, 1998, p. 3).

Māori Centred Research was chosen for this research because Māori were the focus of the research and the researcher was senior and implemented aspects of Social Research methods. The research combined the theories to value Māori and allow the

realities voiced by participants be delivered in a non-threatening manner. Bouma (1993) states that the method section of a research report is when:

you describe and give the reasons for the choices you made with respect to the selection and operationalization of variables, research design, and sample selection procedure. Once you have stated your research question it is possible to raise and discuss these methodological issues. They do not make much sense prior to this point and are missed if raised later. (Bouma, 1993, p. 194).

To keep things orderly a research design was established, theories chosen, research questions identified, and ethical procedures followed. This formalised the method and defined by Merriam-Webster (1998) as “a systematic, established, or orderly procedure or way of doing anything; system order or regularity in general. The disciplines and techniques used in any field of knowledge” (p. 317). Also, it endorsed a qualitative approach. Denzin and Lincoln (1994) state qualitative research to be a “field of inquiry in its own right. It crosscuts disciplines, fields, and subject matter” (p. 1). In addition the word qualitative implies an:

emphasis on processes and meanings that are not rigorously examined, or measured (if measured at all), in terms of quantity, amount, intensity, or frequency. Qualitative researchers stress the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry. Such researchers emphasize the value-laden nature of inquiry. They seek answers to questions that stress how social experience is created and given meaning. In contrast, quantitative studies emphasize the measurement and analysis of casual relationships between variables, not processes. Inquiry is purported to be within a value-free framework. (Denzin and Lincoln, 1994, p. 4).

Therefore, the combination of Māori Centred Research and Social Research methods were proper for this type of inquiry.

Method of Selection

The participants represented two different groups: key people and focus groups. Participants chosen from a list of names represented the key people in Māori communities. The key people had either written about biotechnology, GE or GM, been part of groups involved in this issue, and part of Māori communities. They were academics, public officials, and community workers. It was essential to approach Māori people knowledgeable in the current debates and political developments concerning biotechnology, GE, and GM because they were educated

on the issues. Gaining their insight was important because they were active in Māori communities and at times held or continue to hold leadership roles.

Selecting focus groups were done differently. A range of groups were approached in three areas Auckland, Hamilton, and Gisborne. However, it was difficult to gain a commitment from focus groups to participate because of their availability. There was less impetus on the need of the focus groups to be knowledgeable in biotechnology, GE, and GM. Instead focus was directed at their acknowledgement of being Māori involved in Māori development initiatives and representative of the majority of the Māori population. Fortunately, four groups participated two from Auckland, one in Hamilton, and one in Gisborne.

All participants worked or participated in Māori activities. All key people were of Māori ethnicity and a total of ten were interviewed. Less than five participants in the focus group interviews were of Māori ethnicity. Non-Māori participants were included at the request of the group members because they worked with members of the focus group. About fifty people participated in the focus groups. All interviews were conducted through an informed consent process. The research approach followed along the guidelines of a Māori Centred Research (the information gathered and the process was sensitive to Māori culture) and Social Research (the use of research techniques like focus groups). All participants were asked the following questions to initiate dialogue:

- Question One: What do Māori communities you have worked in think about GM?
- Question Two: How can we communicate these thoughts to the wider community?
- Question three: How can we motivate Māori communities so they take to the issue of GM like they have done for the foreshore?
- Question Four: Under what circumstances might a scientifically sound application be turned down?
- Question Five: In what case will spiritual, cultural, and ethical values hold greater sway than science?

In addition the focus groups were queried for a response to terms like whakapapa, mauri, wairua, and kaitiakitanga. More importantly participants were given a koha for their assistance with the research in appreciation of their knowledge and time.

There are two tables that show the characteristics of the participants. Table 1 provides a description of the Key Participants including their gender, age, and status in the community. In Table 2 the region and status of the Focus Groups are displayed.

Table 1: Description of Key Participants

Code	Sex	Age	Ethnicity	Status
P1	Female	50+	Māori	Doctor Scientist Academic
P2	Female	50+	Māori	Community Worker Advocate for Green Peace Protestor Against GM & GE
P3	Female	31-40	Māori	Government Official ERMA Consultant
P4	Male	31-40	Māori	Government Official ERMA Consultant
P5	Female	50+	Māori	Community Leader International Consultant for Indigenous Flora and Fauna
P6	Female	41-50	Māori	International Representative on Intellectual Property Academic
P7	Male	50+	Māori	Professor Psychologist Academic
P8	Female	50+	Māori	Community Worker Waitangi Tribunal claimant and leader for hapū and iwi
P9	Female	50+	Māori	Community Worker Retired Nurse Involved in iwi/hapū/whānau development of the East Coast
P10	Male	50+	Māori	Doctor Māori Historian and Theologian Academic

Table 2: Description of Community Groups

Code	Region	Ethnicity	Status
WS1	North Shore	Māori	Marae Organisation (Eight people representing over a fifty members in the society)
WS2	Auckland	Māori	Women Group at University (six women representing Māori women on campus)
WS3	Gisborne	Māori	Whānau Organisation (ten people representing over eight different family groups)
WS4	Waikato	Māori	Academic and Student Group (over twenty students and staff in the Waikato region)

Ethical Approach

Ethical consent was gained from the University of Waikato to conduct the research. Assurances were made to the appropriate ethics committee that the researcher would maintain proper ethical conduct in the field. This was achieved by providing information about the research project and processes for participants to take should they decline to participate or request the information they forward be returned. Participants were informed of these ethical procedures in the research before the interviews took place. Once approval was achieved from the participants they were interviewed at their homes, work place, or designated place they felt comfortable and given an Information Sheet, Consent Form, and a copy of the questions they would be asked (see appendices). The ethical procedures consisted on informing the participants of:

1. Their rights to withdraw from the research.
2. Their rights to decline to participate in interviews.

Modifying the Approach

The researcher became aware during the research that instances arose whereby the approach to participants had to be modified to compensate for the situation. An example of a situation that arose in the research was when the researcher scheduled in advance to interview a focus group representing a marae organisation. The interview was scheduled for about 11 am. Upon arrival to the marae to conduct the interview the researcher was informed manuhiri (visitors) were coming on the marae and asked to conduct the interviews after the pohiri (formal welcoming) and join the tangata whenua (marae organisation) in the welcoming. The researcher participated in the welcoming that was followed by a whakawhanaungatanga (getting to know each other) process, kai (meal), then walk around the marae to explain the structures of the organisation. By the time the process finished it was late and the marae participants wanted to go home. The researcher had to reschedule the interviews and loss a large number of participants desiring to be interviewed because they were unavailable for the next interview time. This is an example where the research approach had to be modified. Also, as mentioned earlier the inclusion of less than five non-Māori participants was another example where the research approach had changed to incorporate views of non-Māori although they had a minor part to play in the research.

Analysing the Data

The data underwent two analysing processes. The first processed analysed data using a computer software package called QSR NUDIST Vivo. Questionnaires and tapes from key people were transcribed into text documents then the data was transferred into QSR NUDIST Vivo. Comments that occurred frequently were used as main themes to question in the focus groups. The second process involved a manual analysis of the contents from the focus group interviews. Similar to the computer software, information was coded and frequent occurrences of comments were recorded.

Content Analysis

Content Analysis was applied in this research. It consisted of coding and tabulating the occurrences of certain forms of content that were being communicated and a common procedure (Rubin & Babbie, 1997, p. 421). Content Analysis was used to analyse the questionnaires and interview sheets of in depth interviews and workshops. Coding data, according to Miles and Hubberman (1994) is a main analysis tool to “review a set of field notes, transcribed or synthesized, and to dissect them meaningfully, while keeping the relations between the parts intact, is the stuff of analysis” (p. 56). It involves differentiating and combining the data that is retrieved and in terms of the research allows time to reflect on the information. Coding Data can be at different levels of analysis to which Miles and Hubberman suggests “ranging from the descriptive to the inferential” (p. 58). Information that became a common response from participants were highlighted as the main findings.

Conclusion

Māori Centred Research and Social Research methods were essential for this research. The researcher was of Māori ethnicity, experienced, and a senior member of the research team. The information shared by participants contributed to mātauranga Māori. By utilising aspects of social research, specifically in the analysis of data, it was considered culturally sensitive and allowed the research to be conducted in te reo Māori (Māori language) or English.

Equally important was the ability of the research to be modified in certain circumstances to accommodate for changes made by the participants. The changes were low key and necessary to build a relationship with the participants. Also, the amount of feedback was not measured meaning the researcher accepted the comments whether brief or long to value the knowledge the participants shared to encourage free and open dialogue.

Findings

Kia ü ki a mau ki tö Māoritanga.

Cling and hold on to the essence of being Māori.

Appreciate and honour your heritage.

Introduction

The participants provided a range of responses to provide their perspective on biotechnology, GE, and GM. The perspectives aligned with the overall research project that was to 1) identify ways to sustain biotechnology; 2) communicate biotechnology, GE and GM to the community; 3) record Māori social, cultural and spiritual dimensions of biotechnology, GE, and GM. This alignment produced main themes that are discussed in this section. The main themes are: Relatively Unknown Entity, Biotechnology Brings Risks, Common Cautious Stance, Communicating Māori Language, Education Creates Stability, Participate in Decision-Making, Communicate Sustainable Biotechnology.

Relatively Unknown Entity

Biotechnology, GE, and GM was proven to be an unknown entity to the majority of the Māori participants. The philosophy, language, and words used to interpret or explain biotechnology, GE, and GM were foreign to a large section in the focus groups. Every key person interviewed had knowledge of biotechnology, GE and GM. These participants were actively involved with biotechnology from many positions such as representatives on boards whose role was to oversee the management of this technology to being actively involved in protests against the government lifting the moratorium on GM and GE or representing Māori communities in the Waitangi Tribunal claim 262. However, when questioned about their perception and experience with people in the community and whether Māori had knowledge of this technology the response was the majority did not understand or know. Many Māori people in the communities were reported as never hearing or understanding this type of technology. In the focus group interviews the same response was given that for Māori in community's biotechnology, GE or GM was an

unknown entity to them. Therefore it could be confirmed that the majority of Māori people do not participate in dialogue over this issue because they had little or no knowledge about it and could not contribute to discussions. When participants were questioned the response was mainly 'no I do not know about this technology' or a mixture of perceptions. It was evident that the majority of participants did not understand DNA Mapping and Sequencing, Gene Technology and Cloning.

Māori communities say what they think about the GM. Not enough information for the majority and what they do get is stuff like here's a way you can put it into practice. That's what they do for me, because they don't really want to hear the science around it ... They know generally what it is, but the depth of the science behind it and how it could benefit them back, no. They don't know any of that yet. When you start talking to some about it or they want to listen but others are going, oh it's too hard to understand, and I'm going well it is because the material you're getting is not suitable for Joe Bloggs. ... for them it's not just about reading it's about hearing too in their way. They need to hear it their way, told to them their way and only their own can do that. So as you say if you came out and ran a hui at our marae to explain this that would be really good and then our people would get into it. (P2, 5/12/03).

It hasn't, all this information about GM hasn't reached the grass roots, you know they hear about it on the news or it's in the paper, but from my perspective the community that I went to see two weeks ago for example, never heard about GM. So they are not informed, there is no opinion on something that they know nothing about. (FG2-3, 12/4/05).

Not much in our age group (20 years). We probably never hear about it and not really interested. (FG3-1, 15/5/05).

Is it modifying the food? Is it dolly the sheep? (FG3-2, 15/5/05).

Not in my community they say nothing. (FG3-2, 15/5/05).

Nothing much because we don't really know about it. It's not important to us. (FG3-6, 15/5/05).

Biotechnology Brings Risks

It was accepted by key participants and focus groups that biotechnology, GE, and GM has certain risk factors attached. Even the participants on boards overseeing the applications of GE or GM explaining the benefits this technology brought to society highlighted it contained unknown factors. The focus groups discussed more risks the technology brought as opposed to benefits. Also, the majority of participants were concerned about the existing and future impact of biotechnology on their whānau.

I do believe that communities are being asked to make decisions about using genetic foods and products and services, when they don't fully understand what it is that they are consenting to, and I think what's happening in New Zealand is that it is being mirrored in other parts of the world and the technology is far exceeds both legislations and policy and just general understanding and that's never a good formula. It means that people are consenting to one little thing or that they think what they are consenting to some tiny little discrete project only to find out that there is a huge wide issue involved. Have I ever met any Māori who are just totally disappointed of everything about Genetic Technology? no. Have I met any indigenous people in other parts of the world who were given a cate de blanch? no. So I would say that most that if you took a spectrum of yes, yes but no but or no which is a sort of an ethical frame work way I usually work in for the question being is Genetic Technology useful without development. (P6, 7/05/04).

Why is it risky? and what is safe? and GM are is part of the risk and safety debate and there are some things in which will help us survive and some things that will threaten us. We need to be able to analyse it but confront it, not say, no it won't have anything to do with it, or yeah we will embrace it completely. So it's a question of what is its survival strategy that's going to be most useful in this new world that we're in which is not the natural world right or wrong its how the world works and we need to learn how to cope with it. Well it's the adaptation of the tapu and noa to address Māori times the tapu is about risk. They think that the tapu were risky things that you keep away from, think of the normal as quite safe. I think Māori communities need to see GM as part of modern environment. And I don't think we should be promoting GM debates separate from other debates. Because the bigger debate is how we can ensure the next generation is healthy and is going to survive. And the question is not overdoing the debate as well. GM is really part of the modern risk opportunity, debate those may ask the question how can we make Māori more aware of the modern environment and how to survive and what are the best strategies in order for us to survive. I am not convinced that making GM into itself into a major issue or the other modern issues is helpful. You have a whole range of issues that make up modern living and that we have to way them together so we don't talk about GM without talking about too much food. Or we don't talk about that without talking about educational opportunities. We need to be able to factor GM into being a reality of the modern times. (P7, 27/5/04).

All I know is if science mucks around with what is natural then it is wrong. If we are producing kids or animals that look deformed by experimenting then it is wrong. This type of experiments need to be turned down until scientist can guarantee that no deform things will come out. (FG3-6, 15/5/05).

Common Cautious Stance

It was a common response from all the key participants that Māori were cautious in their approach to deciding whether to support biotechnology, GE, and GM in their communities. Two key participants that occupied positions on government boards overseeing biotechnology applications were supportive on a case-by-case basis. Three key participants from influential government departments were against the lifting of the GM moratorium and only partly supportive of some developments of GE and GM. The remaining five participants were against supporting biotechnology until it could be guaranteed that the benefits outweighed the risks. In the focus groups the majority were anti-GE and GM because they knew little about it and preferred to say no until they had more information. Due to the lack in knowledge many participants were fearful to support this type of technology.

I've met a lot of academics through this job and there's lots of diversity of perspectives within the Māori communities that we deal with and then personally I have a lot of academic friends who have their perspective and their Māori and they have both grass roots perspectives, the ones who are involved in their grass roots back at home are influenced by their academic thinking and learning and then I have also ones who don't say much and go back to the marae. But they have very strong views on it too, and I suppose the surprising thing is how generally everybody is against it, but there's room where people are considering now given changes and conditions like the political and economic positions where people are wondering I wonder what might come out of genetic, anything for Māori that might be positive given that political things, commissions change. i.e. like globalisation is or the right to decide has moved back into the hands of Māori people. I wonder what could happen, the possibilities. But what you write now is people are against it because of the political position that is now present. (P4, 30/01/04).

I have been up and down the country side over this whole issue, I guess what I am saying is my involvement with Māori communities is very, very, extensive in terms of one-on-one discussions, and focus groups, but also the project with (name of co-worker) and I manage the random survey we did. So those are my relationships with the community, so there is a diverse range of views. Ranging from absolute horror to kia tūpato three times. There is a whole spectrum there. The nearest I could get to saying what's a common point of view, common position, is me kia tūpato because we don't know enough about the kaupapa of GM/GO research. I interpret that as not a no neither is it a yes. But it is an open minded stance because when people say kia tūpato they are not saying no. They are saying lets be very careful and

when I get more information I will be in a position to say ae mārīka or kaore. So most of our research my contacts are kia tūpato, so if there is a common view it is that, kia tūpato. (P10, 14/9/04).

I sat on the ethics committee and I was posed with the same question and the scientist couldn't prove to me what they were going to do with the blood that they had collected. So I turned it down because they weren't clear with what they would do with the blood samples once they have collected it. And most of it was going to be burnt or the DNA sent to another research facility in Canada and then reinserted to another research friend over in New York. So it is was the third, fourth, and fifth sampling that I didn't agree to that they weren't upfront about. So I think for me I would turn anything down if you are not upfront with the whole process especially in particularly what you are going to do when you are finished. (FG1-3, 27/6/05).

Communicating Māori Language

The feedback from the participants clearly identified interpreting and explaining biotechnology using Māori language in lay-terms was an acceptable form of communication. The key participants highlighted the importance of using Māori idioms, Māori experiences, and Māori terms to discuss biotechnology, GE, and GM in the community. Four main Māori terms that were raised predominately to discuss biotechnology, GE, GM were whakapapa, mauri, tikanga, and kaitiakitanga. Also, participants' responses were broad and the usage of Māori language at times was high.

Māori people have different genes than those of tauīwi. Through the ages we have found that blood lines are no longer there and are mixed. We start loosing our real Māori and when you look at nga whakatauki o mua, we say ' me haere mai mātou, tawhiti nui, tawhiti roa, tawhiti pāmamao hono ki wairua' that's what they say hono ki wairua but the whakatauki is a proverb that takes you from one area to another for instance instead hono ki wairua is an area hono ki ngaa wai e rua Māori people have a gene that is entirely different than any other gene and they (scientist) take that gene and use it for those people that have diseases, can't find that name of that disease, and that gene is taken from us. And the other one is the pure blood that they get from babies that are born, they take it from the pito, and that is taken over seas and they use it for the same things for healing because the blood is pure and it can only be found in Māori woman who go and have their babies. You are only talking about one thing, but there are so many things happening in the science. That's the problem with our Māori women. There is not enough education on what they should do culturally that is sensitive to their pito. The placenta they must take home and bury it, it is actually the whenua and when they are talking about the whenua they are talking about papatūānuku and

actually giving back to her part of a koha to her so that in time her whole body will go back to that same place so it is important I keep talking to the men on how important their wives. (P5, 26/3/04).

Māori idiom, whakatauki, stories and tradition when you examine it, is it about the GM in particular. ... Talking about intra-species connection I mean the whole story about Rangī and Papa and species being related to each other so in many aspects that is not a novel idea. And what emerged from that was they all found their own domain. Now does that mean the domain is never mixed again? ... The underpinning it all is survival. Survival has always been the dynamic that has kept society functioning. What Māori do is articulate the principles of human dignity for New Zealanders because they can articulate that. It's not really a question of a Māori value, it's a question of a human value. Māori are able to do that. I do not know whether over time the significance of the human value has gotten lost but it hasn't gotten lost in Māoritanga. All the talk mana, manaakitanga, aroha should underpin, and does underpin religious beliefs. (P7, 27/5/04).

I wonder if it is the concept itself why we are not attaching ourselves to it. Perhaps it needs to be i roto i te reo Māori. Takahi tinana no tūkinō tangata. And I think that will cause us to rethink about the concept. I think we need to say our tinana is our ownership and what we put in and out. I think it is like the foreshore and seabed a lot of energy was in there because our tupuna had given that to us it as a task to be kaitiaki. Now we have to shift that to be the kaitiaki of our tinana and the tinana of our people. And I think if we changed that it might send a different message. (FG4-2, 27/6/05).

The participants in focus group interviews were very clear in relaying the message that biotechnology, GE, and GM had to be interpreted in a Māori way. The Māori way was using Māori terminology that came from a spiritual position. The spiritual position referred to showing in language and actions that this technology would benefit Māori and the wider community and not cause harm to them, families, grandchildren, or the environment.

Education Creates Stability

The key participants were uniformed in their comments that biotechnology, GE, and GM should not affect the future generations, the mokopuna. It was common in responses that Māori were concerned about their role as kaitiaki and trying to find ways in which this role could service the people. The uniformed comments resurfaced in the focus group interviews. Both the key participants and focus groups

highlighted education as a key to informing the Māori communities, building knowledge, so that Māori could participate fully in dialogue.

Educating the community on the risk or benefits was important to the participants and relayed as significant to Māori advancement. Education was not confined specifically to understanding biotechnology, GE, and GM, on the contrary, the Key Participants and members from the Focus Group considered learning and understanding tikanga and kawa around the body and environment to be highly important. In doing so, education was seen to create stability around the uncertain factors biotechnology, GE, and GM had to offer. Stability was portrayed as understanding the issues and having knowledge that enabled Māori to participate in discussions and give informed consent.

What we did was we went out with a lot of examples and I had done my best to ensure I was well informed and could explain what was involved including the risks as well as the purported benefits. Now when we went out and explained these things we spent a lot of time saying to people look ask us questions we are not just here to ask you questions. We took time sometimes three hour interviews most of our interviews were three hours to make sure people clearly understood what was going on and we said it in lay people's language. Now we found as a result of that people would say oh so cloning isn't genetic modification? Oh so when you transplant an organ into someone it's not going to affect their genes? Oh so if I had a pigs heart that won't pass on into my moko or my children and when you actually help people to understand a lot of them will say oh well that's not so bad then! Maybe that will save the life of my child. Yeah I would be for it. I feel that a lot of the political rhetoric is feed on people's fears of this information and leads to "anti" responses when in fact when you sat down with people and talked through the issues we got often quite different responses from them. I think most Māori felt a lot of unease with GMO ... I think you could generalise and say there is considerable dis-ease unease out there about GMO as a technology and a lot of this is just an intuition in particular an intuition against the crossing of the species barriers. There was a very definite sense that sharing genes between species is not natural, it doesn't occur in nature, it only occurs in a laboratory through human intervention and therefore somehow this is not tika. It doesn't feel right. But the other strong generalisation that came through was people were prepared to look at the application of genetic modification on a case by case basis. For example when it was explained that insulin is made from the insertion of a human gene into a bacterial cell to create a genetically modified bacteria to produce human insulin people would say "maybe if it saved human lives we would consider it." But there was this strong aversion to genetically modified food crops. Particularly if those food crops contained human genes. Again a generalisation to be made would be not to eat genetically modified food.

Taking insulin is an individual decision. But with eating the food there was a sense of concern about whakapapa in particular if they (the food) contained human genes so all those issues of ancestors, the spiritual implications as well as the material caused considerable unease. Perhaps the clearest of all was no to the genetic modification of native plants. So there were some boundaries or no go areas or areas that were more acceptable than others. More acceptable were genetic modifications for medical purposes and for conservation of the environment if it would help save a species or restore the environment. Yes all of those things Māori were more open to acceptance or approval than if it was for pure research; there was less support for that. (P1, 28/11/03).

You need to train yourselves so you can talk to your own people. Well I'm just about disseminating information to you or if you have a passion about your environment, that's who should have the information and they can break it down, I said, because there might be someone who want to know. In their community this is what they have and how's that going to benefit the GM. At this stage everything is just negative towards GM. They don't want to. Māori see it as a pollution rather than anything good and this community is thinking like that too. So for Māori it's giving it to them. They don't like it because they don't understand it, and if they got it in the messages that they could understand then I think they'll be more vocal. Vocal amongst themselves about it. They're very vocal about the things they do understand. Everybody knows that. But they're not very vocal and that subject hardly ever comes up. When it does they go no, we don't want it here but they can't really give you a good reason why they don't want it, just because someone has told them a negative thing about it, and that could be about interfering with their whakapapa rather than. (P2, 5/12/03).

Participate in Decision-Making

Participating in decisions making was significant to the key participants and focus group. Many used the terms such as kaitiaki to explain that Māori people have a responsibility to take care of themselves, family, and the world around them. The key people were actively involved in areas where they could participate or try an influence decisions made about biotechnology, GE or GM. In the focus groups the majority who were not in influential positions considered themselves to be unable to contribute to the decision-making processes. Some felt that their financial circumstances made them vulnerable to technology arising in their communities and “because of their financial situation it's had to motivate our people not to buy GE or

GM food because income dictates how you spend. Lots of us are on the welfare benefit so we have to go cheap. (FG3-3, 18/9/05).

That dictation to the natural world in Aotearoa is a phase for survival, now if we did that, survive for a hundred days in harmony with nature, the natural world has changed and we don't look so much into the natural world now as in the artificial world, of plastic instant coffee and all those things which are part of nature, now what do we need to survive this world. And the answers might not be what happened a thousand years ago may not be helpful in terms how that there might be some values that we can pick up and use them. I think that the development in the systems public law was a major advance as this protocol society, and I think that we simply haven't taken the concept of tapu and noa and applied it to Māori times. So what we want to know is why is it risky and what is safe, and GM is part of the risk and safety debate and there is some things in which will help us survive and some things that which will threaten us. We need to be able to analyse it but confront it, than say we won't have anything to do with it, or yeah we will embrace it completely. So it's a question of what is its survival strategy that's going to be most useful in this new world that we're in which is not the natural world right or wrong its how the world works and we need to learn how to cope with it. Well it's the adaptation of the tapu and noa to address Māori times the tapu is about risk. They (Māori) think that the tapu were risky things that you keep away from and think of the normal as quite safe. (P7, 27/5/04).

Research showed that the majority viewed government and scientist as having control over experimentations and disconnected from the community. Participants considered government and scientist to hold the power of decision to benefit themselves than the Māori communities.

What is problematic for us are all things that we hold dear these are within us they are not manifested in any way and yet we just know. It is something that we know. But it is very difficult to explain that to someone who has no idea about these spiritual things that keep us together. When we go to the marae there maybe some people there that know nothing about tikanga, but they have it in them and so, they do things right. Those things within you cannot be explained in a scientific way. (FG2-3, 12/4/05).

Socially and culturally sustainable from whose perspective? How do they know that the other side is going to benefit? How do they really know? Do they know enough about the culture to know if it is going to benefit. You know if we looked at our culture, if things were socially and culturally sustainable biotechnology comes from them the majority or the main culture not us. (FG2-3, 12/4/05).

Utilising the Treaty of Waitangi to share control over decisions between Māori and government did not surface as a main theme. A major factor for this lack of

response was participants were not asked directly about the Treaty of Waitangi and whether they felt it had a connection to the research questions. Therefore, participants seldom raised the Treaty of Waitangi as a vehicle to control decisions.

Communicate Sustainable Biotechnology

Communicating biotechnology was an important issue raised by key participants and focus groups. The ways to motivate Māori communities to learn covered a wide spectrum like using the media, television, advertisements, news papers, schools, and common meeting places. It was evident from responses that without knowledge Māori people are excluded from participating in communication. However, through education and various forms of media to inform Māori about the benefits and risks biotechnology, GE, and GM brings to communities meant the technology could be sustained. Sustainable biotechnology could be achieved by passing down knowledge and gaining Māori support and acceptance. *“Socially and culturally sustainability, teach the moko” (FG2-3, 12/4/05).*

I think it's a kind of knowledge where you have to go back to our Māori people and the old people. I talk to my kuia and relate to her all the time. ... She (kuia) just knows that it must be bad because it will interfere with her whakapapa. I said the only time that it'll interfere if we allow our genes to be utilized with some animal genes that in her perspective this is going to be sort of the way they're going to be ... and I said at the moment that's all taking place, has taken place. It's already been engineered but we just don't know that because they've (scientist) have taken our place, over the years, generations of them. So they've (scientist) got it all stored somewhere and you can bet all them scientists have gone through all those, dusted off shelves, your research is your blood someone to find out what in your genes keeps you looking so young. (P2, 5/12/03).

What is it that our ancestors did that is really a historical approach? What happened in the past, so I spent my years of research looking at ways and means generations before us looked at technology, how did they look at an axe? How did they look at nails? How did they look in 1820s at sailing ships, all these new technologies? And so you ask that question, did they just reject them, no, they had a look at it, tried it out, and finally decided I love nails. So now nails are part of Māoritanga, the axe is part of Māoritanga, schooners, most tribes had their own ships, the white potato is a new technology, so the things about our past in the last 200 years tells us that our people were keen to look at new technology work out its kaupapa decide whether they liked it or not, and then go for it. (P10, 14/9/04).

I think as a whānau if this never happened to us, this kidney situation [we may not support it]but because it happened to us as a family or whānau we are communicating what happened to us. So I do think it has to be a meaningful reason to communicate to other people about that sort of thing. It might be good to go to hospital and see how many Māori or Pacific Islanders who are facing kidney transplants or children wards and that's where your aroha comes in. I certainly made a decision that I would be a donor so all of those in our family was something we could communicate. The other one we got communicated was with some of the kuia on the marae, that would say where you are or how are you and how's the family. We went home to do a karakia and the whole whānau marae area all got involved and the whakaaro was in line I think if you communicate something it has to be meaningful and of value. However, if I said this is going to help Pakeha people get rich because this is going to genetically modify our corn and use all my land and we will not get any money from it that would certainly get our community mobilised. So I thinks it kind of what you say that would mobilise the community. But really the government has a say, the source about GM is the government and at the end of the day they have full responsibility with the law and all these issues. (FG4-2, 27/6/05).

Conclusion

Biotechnology, Genetic Modification (GM), and Genetic Engineering (GE) are terms that Māori are still examining in their communities. Although the terms are grounded in scientific knowledge the Māori response to addressing the issues is to adopt an ethical approach that underpins the foundation of scientific research. However, identifying whether biotechnology, GM, or GE is a risk or benefit for the future survival of Māori people are the determining factors that direct decisions whether to support or refuse developments in this area in their communities.

The key participants and focus groups were very clear and uniformed on certain issues. The main issues Relatively Unknown Entity, Biotechnology Brings Risks, Common Cautious Stance, Communicating Māori Language, Education Creates Stability, Participate in Decision-Making, and Communicate Sustainable Biotechnology were highlighted as common responses. It was evident from key participants and focus groups that biotechnology, GE, and GM remains a relatively unknown entity in Māori communities. Since it is unknown the knowledge in communities is limited and biotechnology is largely perceived from the majority of key participants and focus groups to bring more risks than benefits. As a

consequence the communities take a precautionary stance. Caution led the majority of participants to reject technology or resist developments. However, if biotechnology, GE, and GM was communicated using the Māori terminology and the people were educated then a sense of understanding and stabilisation could be achieved. More importantly, if Māori participated in the decision-making processes they were less likely to reject or resist technology because they were in control of decision that affected them. Communicating biotechnology involved, from the perspective of key participants and focus groups informed dialogue. Once this could be achieved it was more than likely that the Māori community would support and encourage sustainable biotechnology, GE, and GM.

Recommendations

*He aha te mea nui o te Ao? He tangata, he tangata, he tangata.
What is the most important thing in the world? It is people, it is people, it is people.*

Introduction

This report recommends some basic steps to take when researching the social, cultural, religious and spiritual dimensions of biotechnology for Māori. It has shown that the depth of knowledge Māori possess to explain social, cultural, religious, and spiritual dimensions that exist and the relationship to biotechnology is vast and complex. Further research in this area would attempt to collate the depth of knowledge and provide valuable knowledge to local and international communities. This section provides an overview of the themes, discussions, and future recommendations to assist those that wish to dialogue with Māori communities over socially and culturally sustainable biotechnology in Aotearoa/New Zealand.

Māori take fundamental positions when considering biotechnology, GE or GM. These positions are reflective of their culture such as survival and whether advancements made from scientist would hinder the future Māori people. Therefore, survival for Māori addressed the basic needs of humanity and the ability to live a healthy life. Any technology that affected a healthy life was considered a threat. Māori look broadly and holistically when discussing biotechnology, GE, and GM. The decisions to approve or reject advancements for Māori depended on the value government and scientist placed on their cultural, religious, and spiritual beliefs. Consequently terms like whakapapa, mauri, kaitiakitanga, and tikanga were an appropriate form of language to explain, record, and deliver a Māori perspective to the issues raised.

The literature review and findings from the research produced common threads of information. Two threads are biotechnology, GE, and GM is not widely known in Māori communities and the lack of knowledge contributes to Māori refraining from supporting decisions to develop this technology. A way forward voiced in the review

and research to bring together Māori communities, government, and the scientific community is through education.

Education for Māori on these issues could be done through a range of mediums like television, Internet, radio, schools, and meetings on marae. Also, Māori were not a strong voice in the decision making areas and struggled to gain the control over this technology affecting their lives. Research showed that Māori were not totally against biotechnology, GE, and GM, rather they resisted to agree with any developments until they are informed and ensured that the benefits outweigh the risks. Basic processes government, businesses, universities, and the wider community can take when approaching Māori communities to discuss this issue would be to:

- Ensure the language used contains Māori language;
- Pitch the issues in a way for a lay person to understand;
- Prepare for criticism and be able to work through issues that are broad;
- Provide refreshments and time for feedback;
- Resource the research properly;
- Modify the research approach so it is flexible;
- Accept the feedback without influencing dialogue;
- Keep the topics to be covered brief and broad.

Breaking down this scientific language so that the Māori communities are able to understand can be achieved by unpacking the language in three stages. The first stage involves trying to define and gather a clear understanding of the scientific language that is being used. The second stage is to understand the scientific language from a Māori perspective. The third stage is to interpret the scientific language in Māori language and idioms that represent Māori knowledge. When the three stages have been accomplished then Māori are in a better position to engage in informed dialogue.

Conclusion

Exploring ways to socially and culturally sustain biotechnology in Aotearoa/New Zealand requires a broad approach. Expecting to find a clear understanding of social, cultural, religious, and spiritual dimensions of biotechnology is similar to looking for a 'needle in a haystack'. Although an understanding may exist the task required to find an answer needs a vast amount of resources to locate a single phenomena. In Te Ao Māori many phenomena exist and the task may be achievable in the future but

not in this present time. However, raising the issues Māori discuss in communities and placing them in literature is a beginning to achieving such an enormous task.

This research provides a look into the dialogues that are occurring in Māori communities. For those able to provide their perspective on biotechnology, GE, and GM it is usually general than specific. The research strove to 1) identify ways to sustain biotechnology; 2) communicate biotechnology, GE and GM to the community; 3) record Māori social/cultural spiritual dimensions of biotechnology, GE, and GM and not compartmentalise the issues. Instead community broad responses were a reflection of the diverse range of issues that Māori had to contend with at a given time that contributed to the lack of substance to a single issue.

Recording the community responses to biotechnology, GE, and GM is important to sustaining this information in the fabric of Aotearoa/New Zealand. It brought forward the main themes Relatively Unknown Entity, Biotechnology Brings Risks, Common Cautious Stance, Communicating Māori Language, Education Creates Stability, Participate in Decision-Making, Communicate Sustainable Biotechnology. In conclusion, these themes bring Māori, government, business, universities, and the wider community a step further towards understanding the religious and spiritual dimensions of biotechnology for Māori and closer together towards understanding each other and it is recommended that these issues be considered when searching for ways to dialogue with Māori communities.

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**The University of Waikato
School of Management**

**Socially and Culturally Sustainable Biotechnology in New Zealand
Research Information Sheet**

Who is the researcher (s)?

The researcher is: Oliver Helena Fiona Te Momo
Commonly called Fiona Te Momo

Where I can be contacted:

Massey University, Albany, Auckland
Telephone (09) 414 0800 x 9043
Email: ftemomo@massey.ac.nz

What is the study about?

The study is about advocacy groups, community organisations/networks, and their stakeholders: social, cultural and religious/spiritual dimensions of biotechnology.

What will the participants have to do and how long will it take?

The participants will be asked to participate in a conversation of questions and answer where the participants will be asked five general questions and the researcher will write down the answers and record the information using a Dictaphone if the participant approves. The participation should not take any longer than an hour and a half with a minimum of time to be fifty minutes depending on responses.

What does the researcher expect the major outcomes from the research will be (e.g. publications, dissertations)?

The research will be published.

What will happen to the information collected?

The researcher will process the information and the results will be written in to a research project. The names of participants will not be recorded instead a code like P1 for participant one will be recorded in meetings and conversations.

What degrees and kinds of confidentiality and anonymity will be required for this research?

The names of participants will not be recorded to protect their anonymity unless the participant agrees. **A research project team views all information collected during conversation or in meetings.**

Declaration to Participants:

Individuals will not be identified in any publication/dissemination of the research findings without their explicit consent.

If you take part in the study you have the right to among other things:

- Refuse to answer any question, and to withdraw from the study at any time.
- Ask any further questions about the study that occurs to you during your participation.
- Be given access to a summary of the findings from the study, when it is concluded.

Researchers Signature: _____ **Date:** _____

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AUCKLAND

**The University of Waikato
School of Management**

Participation Consent Form

Project Title: Programme Title: Socially and Culturally Sustainable Biotechnology in New Zealand

I have read the Information Sheet for this study and have had details of the study explained to me. My questions about this study have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I also understand that I am free to withdraw from the study at any time, or to decline to answer any particular questions in the study. I agree to provide information to the researcher under the conditions of confidentiality set out on the information sheet.

I wish to participate in this study under the conditions set out in the Information Sheet.

Participant Signature: _____

Participant Name: _____

Date: _____

Note: Each participant must be supplied with a copy of their completed consent forms.

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Programme Title: Socially and Culturally Sustainable Biotechnology in

New Zealand
Interview/Conversation Sheet

Dr Fiona Te Momo

1) What do Māori communities you have worked in think about GM?

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2) How can we communicate these thoughts to the wider community?

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3) How can we motivate Māori communities so they take to the issue of GM like they have done the foreshore?

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4) Under what circumstances might a scientifically sound application be turned down?

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5) In what case will spiritual, cultural, and ethical values hold greater sway than science?

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