INSIGHTS AND ENVIRONMENT SCAN

Maa mua ka kite a muri, maa muri ka ora a mua

Those who lead give sight to those who follow, those who follow give life to those who lead

WHETŪ
Consultancy Group

BRINGING TWO WORLDS TOGETHER

Version Number	Document comments	Date
1	**First Draft Report** *Draft report prepared – waiting for Resource Management Act reforms to be announced*	October 2022
2	**Final Report** *Final draft report*	December 2022

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All work contained within this report has been completed for the use of the client, Waikato-Tainui.

Whetū Consultancy Group takes every effort is to ensure that the information, analysis, findings and interventions provided to the client are accurate and reliable.

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The protection of taonga, livelihoods, infrastructure and quality of life.

Every possible future will depend on how we respond to the:

- transition to a low carbon economy, and
- physical environmental changes of places and communities as earth continues to warm

2. ECONOMIC DRIVEN ACTION / RE-ACTION

Forthcoming longer term financial impacts of COVID, and other events, both domestic and global.

Our lives and decision making are influenced by domestic and global economies. Strategic planning needs to consider these economic driven influences. Global events (i.e. Ukraine War / Pandemics), as well as climate change, will continue to impact Aotearoa New Zealand. Watching these trends and their resulting economic impacts is a critical decision-making practice.

3. GOVERNING TE TAIAO

Freshwater, land use change, urban growth, and unlocking the potential of whenua Maaori.

Co-existing with responses to climate change, governance arrangements (and broadly all levels of participation) in the management of te taiao will increase. These will be further intensified as Aotearoa New Zealand moves into an enhanced te Tiriti o Waitangi setting, and policy improvements to enable use of whenua Maaori.

The demand and pressure on our natural resources, and where degradation and depletion is observed and proven, holding agencies and organisations to account, as well as advocacy for preserving te taiao, will be paramount. The exercising of kaitiakitanga will continue to be a significant role for both hapuu and iwi.

4. RAPID GROWTH OF DATA AND DIGITAL ECONOMIES

Data and information flow, (in)equity in data access, and involvement in an emerging new economy.

With the capturing, grouping and categorising of data used to transform business and agency practices, a clear role for iwi Maaori in the control and management of iwi Maaori specific, and derived, data and information (includes maatauranga), needs to be defined at all scales (tangata, whaanau, marae, hapuu, iwi). The emergence and growth of a knowledge/digital economy proffers a significant opportunity.

5. INCREASING AUTOMATION AND AUTONOMY WITH AI

Advancement in technology and the use of artificial intelligence will revolutionise the world we know.

Continuous rise and evolution of artificial intelligence and autonomous systems will result in opportunities that will likely test our values systems and tikanga Maaori e.g. augmented realities. Jobs will be replaced and new ones evolve with increases in outputs and productivity across the board.

6. PRIORITISING WELLBEING

Individual and collective health and wellbeing, and how we manage this now and into the future.

The global aging population (although at a different rate for Waikato-Tainui) and greater research and understanding in this area, will likely result in future focus on aging well and retaining individual wellbeing later into life. In addition, our changing climate may increase environmental related illnesses, as well as new and emerging diseases arising.

7. CHANGING FACE OF EDUCATION

Online, accessible, micro/short courses, to align with the changing workforce and markets.

The influence of the former trends will direct changes in the demands from education (focus on te taiao, health, IT and digital technologies) and how we undertake training. Shorter focused training, more likely to be off campus, enabling a more transient learner with a fluid career. Learners will carry a digital footprint, and will evolve into new jobs not yet known.

PURPOSE OF THE REPORT

BACKGROUND

Whetū Consultancy Group (Whetū) have been engaged by Waikato-Tainui to support the review and preparation of the Waikato-Tainui Five-Year Plan 2025 – 2029.

This report completes Milestone 2 - 'Insights and Environment Scan' of the project.

What is not in this report is the development of specific project focus areas, criteria and prioritising of projects, and consideration of findings from engagement with staff and organisational leadership team. These will all addressed within the next phase of the review work, outputs and subsequent project milestones.

What is an 'Insights and Environment Scan'?

The report is both a national and international review of influences and events, which Whetū has termed "Trends". These have been considered in the context of being potential catalysts of change, envisioned over the horizon of Whakatupuranga Waikato-Tainui 2050 and beyond.

The report provides details of findings from the investigation, as well as seeking to identify likely areas of interest or impact, for consideration and application in the next 5 years, and future 5 year planning cycles, towards 2050.

The overall purpose of the report is to inform the development of the 2025-2029 Five Year Plan process, outlining the rationale and recommendations for prioritising project areas (key themes), and high level forecasting of areas of investment moving forward.

Why an 'Insights and Environment Scan'?

The need to be cognisant of activities around us is critical in a robust strategic plan that has a long and/or enduring timescale. Although this review and preparation is for the Five-Year Plan 2025-2029, the investigation includes consideration of the outcomes sought in Whakatupuranga Waikato-Tainui 2050 over the next 25 years.

The key trends identified in the report are designed to inform Waikato-Tainui in its support of its tribal members and communities to better understand and prepare for long-term futures, bearing in mind that there will always be a level of uncertainty and complexity in what the future holds and how it plays out.

These trends and insights illustrate the emerging patterns of change that are likely to influence future investment, strategy and policy decisions for the future.

He Anga Whakamua

The trends have been considered in the context of and against He Anga Whakamua - the Waikato-Tainui Outcomes Framework.

Consideration into how these trends might impact Waikato-Tainui, and its ability to:

- HAPORI - Grow a prosperous, healthy, vibrant, innovative and culturally strong iwi
- KAUPAPA - Support our marae and for our marae to be vibrant and self-sufficient
- TAIAO - Work towards the restoration and enhancement of our wai and whenua to the state in the maimai aroha of Kiingi Taawhiao
- MAHI TONU - Be a high performing organization making an impact
- WHAI RAWA - Maximise our collective strength to achieve our aspirations

It is anticipated that the outcomes framework of He Anga Whakamua, alongside the investigation, will help to form a criteria matrix within the next stage of the planning and review process.

The matrix and associated decision-making tools will be used to help organise and prioritise work programmes within the strategic planning process.

Niho Taniwha

As a framework, the niho taniwha has been used here to help contextualise the identified trends, and place in an action-orientated framework that reflects Waikato-Tainui. The framework will feature throughout the subsequent stages of the review and planning process.

Within the design, the trends are downward facing, with the strategic responses, currently blank, facing upwards. The upcoming Five-Year Plan 2025-2029 will identify a strategic approach for Waikato-Tainui to push through these headwinds to achieve its objectives, whilst responding to and taking opportunities posed by the identified trends.

CONTEXT

Aotearoa New Zealand

In an Aotearoa New Zealand context, many of the regional and national priorities echo these global trends.

The government often adopts a policy response to address the needs imposed by international and national commitments to address or respond to these trends, whilst also seeking to show leadership in the inclusion of its indigenous people.

This section drills deeper into each trend and considers it in the unique Aotearoa context and where applicable through a te ao Maaori or Waikato-Tainui view.

Consideration of these trends in the context of how they will be felt, or what they mean, for Waikato-Tainui has been undertaken to support the development of future priorities for the review and five-year planning focus.

METHODOLOGY

The investigation builds on the previously prepared documents:

- Output 1: Data Summary Report and
- Presentation at the Waikato-Tainui Hui-aa-Tau 2022.

Whetū undertook research to inform the selected top 7 trends of influence towards the 2050 horizon. The research included a review of recent publications produced by some of the key international consultancies (detailed in reference section at the end of this report) and national leaders in trend research and reporting.

After the seven foci were identified, Whetū undertook further detailed investigation, including:

1. *Review of international literature and research on megatrends, trends, futures, and strategic foresight work; and*
2. *National review of trends and local influences that will/should influence decision making from a tribal perspective*

On completion of the review, the findings were then sorted and categorised by:

3. *Grouping of the key findings into relevant trends in so far as they relate to Waikato-Tainui as an organisation; and*

4. *Identifying the most relevant trends for Waikato-Tainui to consider throughout strategic planning – identifying current focus areas and future focus areas*

From this, Whetū then:

5. *Considered these trends further where they are likely to intersect in ways that could intensify the impact they have on any possible futures for Waikato-Tainui.*

REPORT STRUCTURE

The report presents the seven trends in the following manner:

1. TRENDS

The name for each trend is purposefully titled to create the narrative for action. These are focused on the shorter term, 5 year planning cycle and likely impacts during that time.

For example, "Responding to a changing climate" is not directly about the science and other qualifiers on climate change. The focus is how Waikato-Tainui, and widely Aotearoa New Zealand communities, respond to the current and future impacts of a changing climate.

2. CROSSCUTTING TRENDS

It was noted that a number of these trends intersect whilst also being a standalone trend. These crosscutting trends are identified in a white box on the front page of the each trend, highlighting where multiple issues will be influencing outcomes.

3. WHAT IT MEANS FOR WAIKATO-TAINUI

To give meaning to the information gathered through the research/investigation, Whetū drew inspiration from the notes from Waikato-Tainui workshops that were facilitated internally.

A key phrase that emanated from the workshop notes was "Mana Motuhake" of Waikato-Tainui. Mana Motuhake was selected as the key theme by the organisation, to drive the next 5 year planning phase.

The phrase 'Mana Motuhake' for Waikato-Tainui traverses all parts of the tribal spectrum, and across all roles/groupings within. Using this spectrum as an analysis tool to identify what impact these trends may have for Waikato-Tainui, in turn supports planning for Mana Motuhake across all parts of the organisation.

Whetū has defined roles/groupings within Waikato-Tainui as:

- Tangata, or the Individual (tribal member)
- Whaanau, both as a household and whaanui
- Marae
- Hapuu
- Iwi and organisation, and
- Taiao

4. INSIGHTS

The fourth part of each Trend section contains the 'Insights' rationale. This includes research and summary of relevant findings to support the identification of each trend and details why it is seen as important for Waikato-Tainui. This part of the analysis applies a longer term view out to 2050, where possible or helpful to do so. Many of these trends however, are dynamic and once considered alongside cross-cutting variables, the less certain the future becomes and as does the ability to predict it. The essence of this report is to identify plausible futures based on the evidence of and likelihood of a trend of influence.

## DOUBLE VOWELS AND MACRONS

To respect the tikanga and kawa of Waikato-Tainui, the report uses double vowels instead of macrons in te reo Maaori. The exception to the use of double vowels in this report is where there is direct citation from referenced documents, or of names of legislation or businesses (e.g. Whetū Consultancy Group) where either a macron or no macron (single vowel) has been used.

1. RESPONDING TO A CHANGING CLIMATE

The protection of taonga, livelihoods, infrastructure and quality of life. Future scenarios in a changing climate will depend on how Aotearoa New Zealand responds to both the transition to a low carbon economy, and the physical environmental changes of places and communities as earth continues to warm.

RESPONDING TO A CHANGING CLIMATE

GREEN ECONOMY

MIGRATION
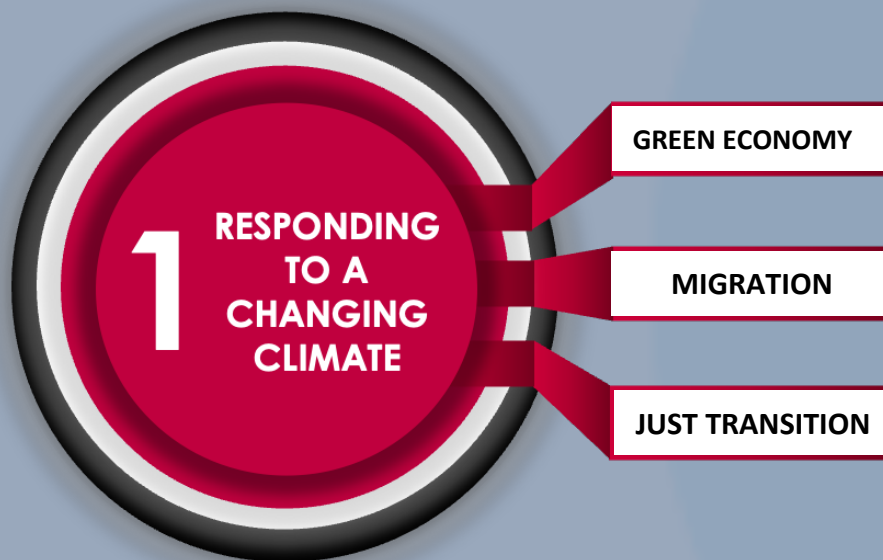
JUST TRANSITION

CROSSCUTTING TRENDS

- ECONOMIC DRIVEN ACTION / RE-ACTION
- GOVERNING TE TAIAO
- PRIORITISING WELLBEING

WHAT THIS MEANS FOR WAIKATO-TAINUI

- **Tangata**
  Changes in employment and challenges of transition costs for businesses/employers. Opportunities in new and emerging roles are likely, for those that are prepared.
- **Whaanau**
  Increasing compliance/transition costs for businesses may be passed on to household costs of goods and services. They may also note an increase in hazards and weather events that pose a risk to their whaanau in at-risk locations.
- **Marae**
  May face similar impacts as whaanau. Marae located in areas at risk, will face increasing instances where marae are inaccessible or where the infrastructure is unable to support in operations and events such as tangihanga etc.
- **Hapuu**
  There may be demand by communities and agencies to engage experts in tikanga, reo and maatauranga on localised responses to natural hazard(s) and measures to adapt and mitigate, and resilience.

An opportunity exists for leveraging hapuu relationships and collaborative approaches to support marae that are under growing pressure from climate related risks.

- **Iwi/Organisation**
Costs of transition may be felt. Expectations around transitioning to electric fleet, reducing operational footprint and both the practical and financial costs of this transition and associated reporting. Budgets will need to reflect these costs in operations. Development of a Waikato-Tainui Climate Change Risk assessment will impact work programmes across the organisation – asset management, insurance, environment and taonga repatriation. Increase in governance responsibilities

- **Taiao**
Access and use of climate related data will be critical for enabling decision making around risk exposure for te taiao. Relevance of maatauranga being applied in this context will come to the fore and require robust protocols on sharing, provenance and use.

INSIGHTS

Climate change is an issue for the ages, now and into the future. Due to the magnitude of this issue, it is one that requires policy and legislative reform to ensure application of environmentally friendly practices that reduce emissions in all areas as well as societal change towards mitigation, adaptation and preparation.

There are a number of values and principles that drive Waikato-Tainui, that will be impacted in varying degrees and in differing ways in our climate future, specifically by 2050:

- **Manaaki** - The ability to manaaki manuhiri may be impacted by changes in traditional harvesting timing and abundance. Marae, locations and sites of cultural value may be threatened and destroyed, all impacting traditional hosting and practicing of manaakitanga.

- **Kaitiakitanga -** The ability for mana whenua to fulfil its responsibilities to care for the natural environment. The consequences of larger scale physical climate change impacts include infrastructure and assets being destroyed, these will in turn impact the ability to care for te taiao. Additionally, the whakapapa connection between Maaori and their whenua may result in additional emotional and spiritual impact as Maaori experience these physical impacts on their whenua. There may also be conflict between Maaori and tau iwi approaches: such as wanting areas protected against coastal inundation and allowing natural reclamation by the sea. This issue is particularly relevant to mana whenua.

- **Whanaungatanga -** Threats to connectivity will impact the physical outworking of whanaungatanga in some cases and the ability for iwi and tribal members to rely on their

existing networks/infrastructure. Disruption of ICT systems and road networks will impact physical and digital kanohi-ki-te-kanohi interactions that many rely upon. The ability to hold and attend tangi will also be impacted, and in turn this will have a significant negative impact for Maaori. This was a challenge that was experienced during the recent COVID-19 lockdowns.

- **Maatauranga -** Expressing, educating, and enabling the use of maatauranga in relation to stories, whenua and taonga may be compromised, where these physical climate change risks typically occur. Damaged physical infrastructure may impact accessing and engaging with whenua, sharing maatauranga, knowledge systems and practices.[1]

Physical impact of Climate Change

Climate change is bringing multiple different changes in different regions – which will all increase with further warming. These include changes to wetness and dryness, to winds, snow and ice, coastal areas and oceans. These changes have significant impact for Maaori. It may impact on the timing of tohu (environment/cultural indicators), damage culturally significant

places and pose a risk to taonga species and the ability to manaaki traditionally and in a contemporary context. It may also compromise the ability to pass on maatauranga (includes koorero tuku iho) where resources are lost. It is expected that any obstruction to accessing keystone species will adversely impact Maaori customary practice, cultural identity, social cohesion, and well-being, with valued domestic and cultural infrastructure, such as marae and urupaa, often located on exposed, erosion-prone lands.[2]

Changes are likely

For New Zealand, future projections show a warmer, wetter and windier climate, with more extreme daily and seasonal variation and inconsistent geographic effects.

Over the next century, the Waikato Regional Council notes that the Waikato region can expect:

- rising sea levels, more extreme weather, warmer summers and milder winters with seasonal rainfall shifts.
- It is projected that the drought risk will increase in the north and east of the Waikato region over spring and summer, and there may be seasonal changes in rainfall and wind in the west[3].

[1] Whetū Consultancy Group, 2021. *Climate change in Tāmaki Makaurau: Understanding how risks and opportunities may be different for Māori Businesses.* Summarised from report commissioned for ATEED, Auckland Council.
[2] Manaaki Whenua Research. (2021) He huringa āhuarangi, he huringa ao: a changing climate, a changing world. Prepared for: Ngā Pae o te Māramatanga

https://www.landcareresearch.co.nz/assets/researchpubs/He-huringa-ahuarangi-he-huringa-ao-a-changing-climate-a-changing-world.pdf
[3] Waikato Regional Council, 2019, Climate Roadmap
https://www.waikatoregion.govt.nz/assets/WRC/WRC-2019/Climate-Roadmap.pdf

These climatic changes will have implications for local communities, many of whom are located along the coast or in floodplains and/or have livelihoods in industries that will be significantly impacted by changes in seasonality or weather patterns, such as agriculture, horticulture, forestry and tourism.

Over 80% of Maaori land is susceptible to major erosion events such as landslides. Climatic changes are more than likely to increase these risks. Maaori are also soon to own nearly 40% of at risks commercial forestry plantations, and more than 33% of fisheries quota by volume which is vulnerable to ecosystem change, particularly for at risk species like paaua, kooura and hoki.[4]

Waikato District Council have begun work on a deeper Climate Change Risk Assessment, and have identified some high level risks within the region, which will support a deeper Waikato-Tainui analysis being undertaken, to consider these risks for areas where whaanau are living or where marae are located in more at risk zones.[5]

Auckland Council have undertaken work on predicting and assessing a 2110 future scenario.[6] This report focuses past the actual physical impacts and moves towards what these physical impacts will mean on related infrastructure and assets for people and infrastructure. Predicted changes for 2050 will be less intense but will include most of the projected impacts, to a lesser degree and in a Waikato context.

- Maritime infrastructure and maritime transport assets are damaged or destroyed
- Information and Communication Technology systems are disrupted
- Electricity supplies are disrupted
- Road networks are damaged or destroyed
- Flights to and from Auckland International Airport are disrupted
- Water supplies are reduced, disrupted, or contaminated
- Built assets that are necessary for service provision are damaged or destroyed
- Assets, such as construction sites, crops and livestock, are damage or destroyed
- Disruptions to systems that are sensitive to seasonality and changes in climatic parameters
- Large scale ecosystem change
- People are exposed to environmental hazards[7]

Overall, changing climatic conditions are expected to adversely impact the natural assets of the Maaori economy. Due diligence will be required by whaanau/hapuu/iwi to better understand the risks and opportunities, and create strategies that include

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[4] Ibid n 2.
[5] https://www.waikatoregion.govt.nz/assets/WRC/WRC-2019/Report-Phase-1-Phase-2-Waikato-regional-climate-change-risk-assessment.pdf

[6] AECOM. (2020) Auckland Economic Climate Change Risk Assessment.
[7] Ibid n 6.

divesting risky assets and adopting new production systems and practices.

He Oranga Taangata – Human impacts

The expected impact that Aotearoa New Zealand's changing climate is likely to have for Maaori is likely to be disproportionate.[8] These impacts include increased exposure to harmful weather events, reduced water quality, particularly where infrastructure is already minimal. Access to health systems and infrastructure will also be challenged, exacerbating health inequalities.

Understanding these physical health impacts for Maaori will be a critical part of providing appropriate support and wrap around services where required by the iwi.

Green Economy - Impact of the Transition to a Low Carbon Economy

In addition to the threats posed by physical change, there are also the threats of the impacts that individuals and communities will face as a result of the transition towards a low carbon economy. These include economic impacts through businesses unable to transition, resulting in loss of employment, income and resulting social implications. Newer

technologies replacing existing workforce and business practices also pose a risk. Changes in transport and energy that will limit and isolate some areas further, also impacting employment opportunities and access to education and services. All of these impacts have the ability to affect iwi members to a greater or lesser degree, dependant on their physical location, current socio-economic and health status. Electrification will be a critical piece of this puzzle and poses challenges and opportunities for the iwi and tribal members.[9]

The opportunities that exist within this ever increasing green or low carbon economy are in fact bountiful. The role that iwi/Maaori will play in demonstrating indigenous leadership and innovation, presents a huge opportunity for growth and development. Principles of functioning as a 'circular' economy are being advocated as a key steps towards a green economy and align well with many te ao Maaori principles. The opportunity to work towards applying these principles o circularity within the organisation and greater iwi context should not be overlooked.[10]

Policy Driven Change

Both national and international policy will and are already playing a huge role in influencing change. New Zealand has

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[8] Ibid 2.
[9] BCG. 2022. The Future is Electric Summary Report. https://web-assets.bcg.com/b8/ba/ce97b6334f019c20269a398800c2/summary-brochure-the-future-is-electric.pdf

[10] Sustainable Business Network, Going Full Circle, September 2021.
Global CAD. GREEN economy and Climate Change A driver for a more sustainable development. https://globalcad.org/en/expertise/green-economy-climate-change/

committed under the Paris Agreement[11] to help limit global warming to well below 2°C above pre-industrial levels. Through their Nationally Determined Contributions (NDC) New Zealand has committed to pursue specific efforts to reach a target of reducing net emissions by 50 per cent below 2005 gross emissions for the period 2021-30. These commitments have been reflected in a number of iterations of climate related legislation, with the most recent being the Climate Change Response (Zero Carbon) Amendment Act 2019 which established a new domestic emissions reduction target for 2050. Emissions reduction budgets are established periodically with the current budget covering 2022-2025. The most recent action from the government has seen the publishing of Aotearoa's first Emissions Reduction Plan in May 2022 which has significant operational impacts for farming, forestry and carbon accounting. All highly relevant for Waikato-Tainui asset management and operational practices.[12] To bring about changes in farming and business practices, regulatory and compliance costs will increase and in turn put pressure on businesses, staff and profitability. Alternatively, opportunity is presented at every turn for those that wish to adapt their businesses, find niche markets or develop products that support the climate transition or enable those to move towards low emissions with pace.

The Emissions Reduction Plan specifically acknowledges that maatauranga Maaori will help us to learn and better inform decisions and be activated through kaupapa Maaori and tangata Maaori solutions. This nod to prioritisation of funding will result in significant enquiry and seeking out of Waikato-Tainui maatauranga for this purpose. Clearly having defined protocols in place to support, govern and protect this maatauranga and related use, will be critical to keep this process Waikato-Tainui centric.

With emissions reduction planning, national and climate adaptation planning taking place, maintaining a presence, and a voice during these discussions on an ongoing basis and post-delivery will continue to be important. These conversations will inform the regional and local discussions with Council's and through co-governance and joint management committees will influence local level behaviours and planning. For Waikato-Tainui this kaupapa will be enduring and ongoing and will require resourcing to support the Ministry for the Environments significant work programme of consultation on these issues.

The resulting emissions reductions targets imposed through policy will result in economic and operational business impacts. Being equipped to support Waikato-Tainui tribal businesses through these barriers to success, will need to be a critical part of paakahi support moving forward.

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[11] https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

[12] https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/

Climate change being viewed in the context of a trend crosses all boundaries and influences all other trends as they emerge. It is the great intensifier, where layering the impacts of climate change with the other following trends has the potential to greater the impact or increase the opportunity

The way that the iwi responds to the threats and risks posed by changes in climate, changes in legislation and policy and the resulting impacts from the transition to a low emissions economy, will be pivotal and should be at the epicentre of all strategic decision making.

2. ECONOMIC DRIVEN ACTION / RE-ACTION

Forthcoming longer term financial impacts of COVID, and other events, both domestic and global. Our lives and decision making are influenced by domestic and global economies. Strategic planning needs to consider these economic driven influences. Global events (i.e Ukraine War / Pandemics), as well as climate change, will continue to impact Aotearoa New Zealand. Watching these trends and their resulting economic impacts is a critical decision-making practice.

2 ECONOMIC DRIVEN ACTION

GREEN ECONOMY

MENTAL HEALTH

POLITICAL SHIFT

CROSSCUTTING TRENDS

- **RESPONDING TO A CHANGING CLIMATE**
- **RAPID GROWTH OF DATA AND DATA ECONOMIES**
- **PRIORITISING WELLBEING**

WHAT THIS MEANS FOR WAIKATO-TAINUI

- **Tangata**
  As contributing whanau members, may be impacted through changes in employment that may result from pressures related to inflation and interest rate rises, in addition to transition costs. Opportunities in new and emerging roles within green economy.

- **Whaanau**
  May be in the midst of significant financial uncertainty and facing the impact of inflation and interest rate rises, directly impacting their ability to provide for their whaanau in the short to medium term. Whaanau may also face associated impacts of financial stress which include burnout, mental and physical health challenges.

- **Marae**
  May in turn feel this strain on their connected whaanau. They may also face potential reduction in dividend

should Tainui Group Holdings face profitability decline associated with the economic climate. Planning for reduction in emissions at marae level will become more pressing.

- **Hapuu**
Prospects for synergies and collaborative approaches to circular economy opportunities that might otherwise be difficult to achieve alone. Collective strength but more dynamic than full iwi operations.

- **Iwi/Organisation**
Inflation may impact on all costs related to inflation and other economic pressures. Being prudent will be even more essential, when tribal members are facing hardship. Focus on data driven action will support innovative decision making.

- **Taiao**
When economic conditions worsen, focus on environmental gains often becomes a luxury. Taiao funded opportunities may become more scarce and as a result, revitalisation may slow. Maintaining access to environmental data will be critical for enabling decision making to better align with the most pressing needs for te taiao.

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[13] Roland Berger, Trend Compendium 2050: Six megatrends that will shape the world. December 2020.

INSIGHTS

The economy is impacted most significantly by other trends and events that occur at any given time. Both shock events, and those that are foreseen, result in economic forces that impact society, businesses and policy decision making. There is a level of economic uncertainty. Internationally, the event of COVID impacting across all nations, sectors and economies, Aotearoa New Zealand may have not yet seen the full resulting impact of the economic policies adopted during COVID, nor the resulting impacts of the global lockdowns that occurred and resulting events of 2020-2021. On near completion of this report, the Reserve Bank of New Zealand Te Pūtea Matua increased the official cash rate 0.75% in response to global activity and national consumer and market activity.

Roland Gerber[13] notes that heading towards 2050 will see a global power shift noting sectoral transformation and a rising debt challenge contribute to this. They note that global value chains are under revision with a new power bloc emerging. Sectoral industrial transformation processes are also progressing with decarbonisation as the primary driver.
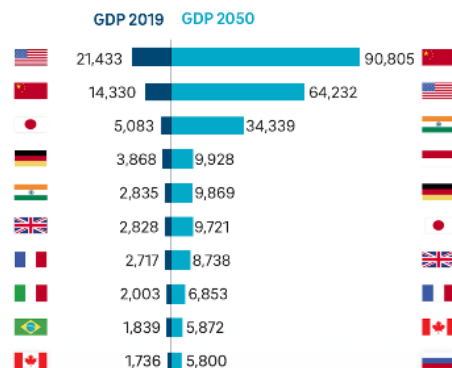
Economic power is shifting further toward emerging countries – With RCEP, Asia-Pacific countries set the course for a global economic power bloc

In 2050, 3 of the top 5 global economic players will stem from emerging markets

Top 10 countries in terms of nominal GDP in 2019 and 2050 [USD bn]

	GDP 2019	GDP 2050	
USA	21,433	90,805	China
China	14,330	64,232	USA
Japan	5,083	34,339	India
Germany	3,868	9,928	Indonesia
India	2,835	9,869	Germany
UK	2,828	9,721	Japan
France	2,717	8,738	UK
Mexico	2,003	6,853	France
Brazil	1,839	5,872	Canada
Canada	1,736	5,800	Russia

Sources: Oxford Economics; EEAS; Roland Berger

Roland Berger

The pandemic has clearly accelerated the global debt burden, lead by government economic/financial responses to the pandemic. All of which contribute to the resulting shifting of power by 2050 seeing China at the top.[14]

Also noted since the Global Financial Crisis, global rates of growth have nearly halved, with global supply chains weakened and a trend toward more domestic production has been observed. Noting these changes and New Zealand's comparative distance to market, we can lean into a preference for domestic production being in line with these trends. Noting that other countries that are often recipients of exported

products may be less dependent on them into the future. Key supply and demand drivers.

COVID-19 Response and Aftermath

COVID-19 impact on health, wellbeing, businesses, education and Aotearoa New Zealand's economy was significant. The impacts of COVID-19 will be considerably further reaching than the initial impact felt. The retraction in spending, export, and trade, alongside one of the largest remediation packages in the history of the New Zealand government will leave a hole in our economy for many years to come.

Depending on election outcomes in 2023, there may be a considerable impact on commitments made for the benefit of Maaori across the board. Being cognizant of these possible changes and how they might impact Waikato-Tainui's internal work programmes and funding, will be critical to how the tribe operates moving forward. Being nimble and responding to support the areas where the tribe is invested in outcomes, will be critical. Having available resource to plug into these gaps to ensure continuity of delivery of these programmes seen by the tribe as critical success factors, would be recommended.

Climate Transition

As noted earlier in this report, the multifaceted nature of future trends cannot be overlooked. The economic impacts of the

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[14] Ibid n 13.

transition of businesses to a lower carbon future will be significant. Global Compact Network Thailand has developed SDGs Mega Trends 2022: New trends for private sectors to transform business and tackle climate change. This clearly details how businesses can and will be leading and influencing the climate transition, and in turn show the economic impact that climate as a trend will have on the business community. Both as a driver for massive growth not yet seen, as well as a catalyst for industrial and systems change. The report notes the following:

- Business Model Transition: Revision and transformation from traditional methods to green businesses or establishment of alternative business models for sustainability to increase value and reduce negative impacts on the environment, with chain value improvement. By implementing innovative development on basic infrastructure, organisations are prompted to handle changes and transition into sustainable industries that responds to future lifestyle trends and commit to reducing greenhouse gas emissions.

- Green Innovation: Investment in innovative green technology and clean energy can be applied throughout the value chain, such as increasing the proportion of alternative energies with lower CO2 and pollutants, adjusting strategies in production and services and reducing negative effects of the value chain on the environment.

- Circular Economy: Circular Economy promotion to build sustainability throughout the production chain with technology used to create value as well as cultivating available resources for maximum efficiency throughout product life cycle.

- Nature-based Solutions: Biodiversity recovery and resilience through nature-based solutions, including forestation to help reduce carbon dioxide, enabling stability for humans and animals, restoring green abundance and preserving biodiversity.

- Human Rights: Respect for human rights and equality as well as reducing gaps in access to resources. Protect vulnerable groups prone to risks caused by 'Just Transition' trends involving farmers' standards of living, upstream industries, SMEs, career support for vulnerable groups, social welfare, and new skills training for the workforce.[15]

These comments show how and the ways in which 'Responding to a changing climate' will play a huge role as an economic influence now and into the future.

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[15] Global Compact Network Thailand has developed SDGs Mega Trends 2022: New trends for private sectors to transform business and tackle climate change https://globalcompact-th.com/news/detail/811#

Comprehensive and Progressive Agreement for Trans-Pacific Partnership

The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) is a free trade agreement involving 11 countries in the Asia-Pacific region, which includes New Zealand.

It is outlined on the website for Ministry for Foreign Affairs that the economies account for 13.3% of world's Gross Domestic Product (GDP), which is worth a total of US$10.6 trillion.[16]

The purpose for identifying the CPTPP is to bring to attention that although there is recognition of te Tiriti o Waitangi and that commercial opportunities exist for Waikato-Tainui, there have been some concerns identified by the Waitangi Tribunal. It is outlined in their report that the issue of concern relates to the e-commerce provisions and data sovereignty.

The Tribunal's report concluded that the risks to Maaori interests (arising from the e-commerce provisions) are significant and that reliance on the exceptions and exclusions to mitigate that risk falls short of the Crown's duty of active protection.

Overtime, as activities continue and economic integration between economies strengthen, the sharing between members of the CPTPP (i.e of technology and/or investment), will have a

determining factor in the economic future of Aotearoa New Zealand.

Other events and economic impacts

Events which make a huge impact for shorter periods of time are things like the war in Ukraine. These will have many impacts that are often not foreseen. Identifying the dominant industries in the impacted regions and whether Aotearoa New Zealand are recipients of those goods or derivative products, is one of the most effective ways of considering the length and depth of impact of the interruption caused by such events. Also considering whether they are dominant consumers of New Zealand or local Waikato-Tainui produced goods enables us to quickly identify likely economic impact if those consumers may not be able to receive Aotearoa New Zealand derived and branded products for some time, or if supply chains are impacted.

To ensure viability and longevity, organisations and companies need to be able to learn quickly, be more resilient to shocks, and adapt in the face of adversity.[17]

The Future of the Metaverse

Explored further within Section 5 – Increasing Automation and Autonomy with AI – the Metaverse[18] deserves more than a

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[16] https://www.mfat.govt.nz/en/trade/free-trade-agreements/free-trade-agreements-in-force/cptpp/comprehensive-and-progressive-agreement-for-trans-pacific-partnership-text-and-resources/

[17] https://www.bcg.com/capabilities/digital-technology-data/overview

[18] The Metaverse's definition remains fluid and is likely to continue evolving. But the consensus view, is that the metaverse is the next iteration of the internet,

mention within economic parameters. Some of the largest global consultancies[19] are all indicating that the Metaverse has the potential to unleash the next wave of digital disruption, impacting everything from employee engagement, to the customer experience, omnichannel sales and marketing, product innovation, and community building. [20]

Examining its potential effect on all parts of tribal community, iwi, hapuu, whaanau and individuals should be a critical part of strategy discussions, with the Metaverse possibilities driving a very different world within the next decade.[21]

With private equity investment in the Metaverse and related technologies sitting at $13 billion USD in 2021, the forecast growth and value creation associated with the Metaverse is predicted in 2030 to be at $5 trillion USD. Such growth in under a decade speaks to the volume of impact that this trend is likely to have in multiple facets of life, and particularly in all spaces

that merge into our economic influences such as industry, employment, consumer markets and spending.

Reserve Bank of New Zealand Te Pūtea Matua

In November 2022[22], it was identified by the Monetary Policy Committee for the Reserve Bank of New Zealand that inflation is too high (7% at the writing of this report) and employment is beyond its maximum sustainable level. It therefore acted to return inflation to its target of between 1% – 3% per annum.[23]

In their assessment, the Reserve Bank recognised international economic developments where food and energy prices have increased, alongside expectations for global economic growth to decline, the anticipation of a global growth slowdown will affect New Zealand through trade and financial channels, and increased economic uncertainty impacting on people's confidence.

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wherein the internet becomes something that people immerse themselves in more deeply rather than something they simply view: an evolution from 2-D to 3-D across a range of interfaces, including augmented reality (AR) and virtual reality (VR). As with other transformative technologies such as the cloud and AI whose evolutions have spanned decades, the metaverse's early consumers and leaders—including investors and CEOs—will shape its future.
[19] McKinsey and Company - https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/value-creation-in-the-metaverse
PWC - https://www.pwc.com/gx/en/issues/c-suite-insights/the-leadership-agenda/demystifying-the-meta-verse.html
KPMG - https://home.kpmg/xx/en/home/insights/2022/04/the-future-of-the-metaverse.html

Bain & Company - https://www.bain.com/vector-digital/web3-and-metaverse/
BCG - https://www.bcg.com/publications/2022/four-control-models-of-metaverse
Deloitte - https://www2.deloitte.com/cn/en/pages/technology-media-and-telecommunications/articles/metaverse-whitepaper.html
[20]https://www.mckinsey.com/~/media/mckinsey/business%20functions/marketing%20and%20sales/our%20insights/value%20creation%20in%20the%20metaverse/Value-creation-in-the-metaverse.pdf

[22] https://www.rbnz.govt.nz/hub/news/2022/11/higher-interest-rates-necessary
[23] https://www.rbnz.govt.nz/monetary-policy/about-monetary-policy/inflation-and-maximum-sustainable-employment

The report on the labour market outlined that there are shortages which remain a significant constraint on economic activity. Additionally, high consumer price index (CPI) inflation and competition for workers are putting upward pressure on wages. The Committee observed that overall wage growth is not exceeding CPI inflation after accounting for productivity growth. While wage growth for people in the same job is generally not keeping pace with inflation, many people are changing jobs or increasing their hours worked to achieve real income growth. It was noted in the report that public sector wage growth has lagged that in the private sector and viewed this lag as representing an upside risk to wage pressure going forward.

Whilst the financial system remains resilient in the view of the Reserve Bank, the resilience of household balance sheets to scenarios of higher interest rates, reduced labour demand, and declining house prices, was of interest when making their decision to act.

Their economic projection is that the Aotearoa New Zealand economy will temporarily contract by around 1% from 2023. Although the exact timing and extent of negative Gross Domestic Product (GDP) growth was difficult for the Reserve Bank to predict, they are hoping for a short period of contraction.

Aotearoa New Zealand – Government Elections 2023

The forthcoming 2023 year will see Aotearoa elections. Based on the other trends and uncertainties emerging in the term, there could well be a change in government, which will result in significant changes in funding priorities and commitments promised by the incumbent Labour party. This will likely have considerable impact on a number of large policy directives currently underway and detailed in this report, and may result in austerity measures being required. This is likely to have impacts across the organisation where projects and funding contributions have been promised by the government.

The possibility of other measures that impact whaanau wellbeing should also be expected, particularly where whaanau are dependent on support packages that may be reviewed.

Equally, should Labour remain in power, their agenda is likely to continue but will result in further scrutiny should Aotearoa New Zealand face a significant global recession.

3. GOVERNING TE TAIAO

Governing Te Taiao co-exists with how Aotearoa New Zealand responds to climate change. Governance arrangements, decision-making and policy direction on the management of natural resources will increase the level of participation from iwi and hapuu as Aotearoa New Zealand moves into an enhanced te Tiriti o Waitangi setting.

The demand and pressure on our natural resources, and where degradation and depletion is observed and proven, holding agencies and organisations to account, as well as advocacy for preserving te taiao, will be paramount. The exercising of kaitiakitanga will continue to be a significant role for both hapuu and iwi.

3 GOVERNING TE TAIAO

- RIGHTS & INTERESTS
- MANA WHAKAHAERE
- DIGITAL ENABLEMENT
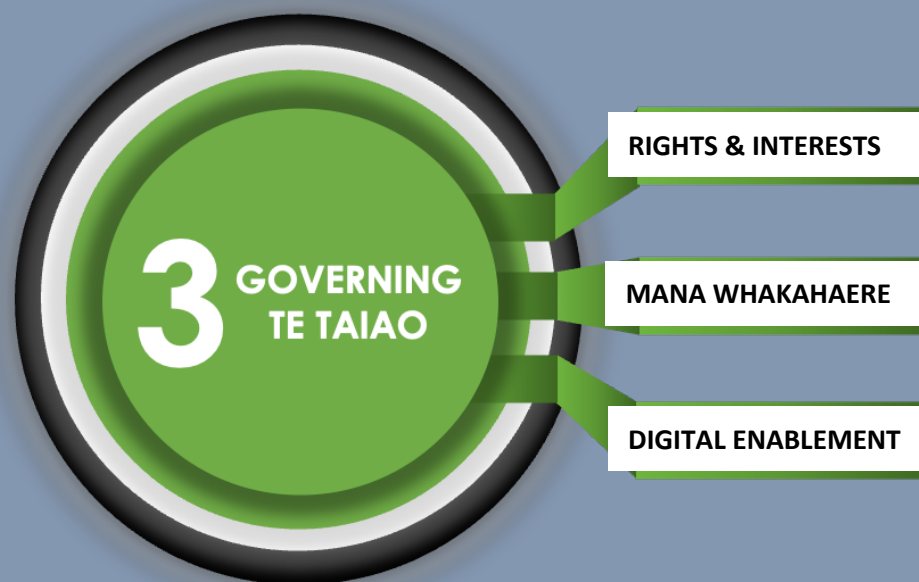
CROSSCUTTING TRENDS

- **RESPONDING TO A CHANGING CLIMATE**
- **ECONOMIC DRIVEN ACTION / RE-ACTION**
- **INCREASING AUTOMATION AND AUTONOMY OF AI**

WHAT THIS MEANS FOR WAIKATO-TAINUI

- **Tangata**
  Where a person is deeply connected with te taiao or has relevant expertise and interest, there may be considerably greater opportunity for both working in te taiao and in governance.

- **Whaanau**
  There could be environmental stewardship expectations and requirements in/of the home, specifically with waste management of organic waste and categorising of recyclables. Similarly, changes in habits will be needed with water use and energy consumption. It's likely there will be increase in rates and costs of living as New Zealand transitions towards low emissions living.

- **Marae**
  Marae will need to consider practices around waste management (includes recycling), water use and energy

consumption. The transition to sustainable operations and low emission practices for marae whenua will likely incur costs and possible penalties if transition is slow.

- **Hapuu**

  Increased participation in statutory processes and decision-making is a strong likelihood for hapuu. It is also envisioned that there will be demand by communities and agencies to engage experts in tikanga, reo and maatauranga. There will be a focus on localised responses to developments, natural hazard(s) and measures to adapt and mitigate, towards resilience.

  It is also anticipated that there may be increased opportunity for taiao restoration projects.

- **Iwi/Organisation**

  Balancing active protection and sustainable management, including achieving a low emissions economy, will likely be of major focus. Renewable generation and its infrastructure will be located in environments where there is high wind (mountains and ranges), where water flows and crashes (freshwater and costal), and where geothermal resource is accessible.

  Keeping Iwi partners to account will be important and will need Waikato-Tainui positioned to monitor and manage the taiao independent of its iwi partners. This will require investment to have access to, and storage of, data and evidence.

Additionally, the role that maatauranga Maaori, tikanga and other practices have in these emerging spaces will be critical and making decisions around integration and collaboration with hapuu will be key.

- **Taiao**

  Te taiao is the at the centre of this trend. Advocation for its protection, preservation and restoration will require continued strong leadership going into the future, and data, information and maatauranga aa iwi/hapuu/whaanau will be central in the development and measurement of environmental bottom lines and success.

INSIGHTS

Aotearoa New Zealand is going through an extensive change in its resource management system(s).

The Resource Management Act 1991 (hereon "RMA"), the primary legislation in New Zealand that manages the use, development and effects upon our natural and physical resources, underwent a comprehensive review, and is in the process of repeal and introduction of new legislation.

In the same window of system change is the introduction of the Water Services Entities Bill. Although a water service infrastructure focused regulation, the use of water/natural resource is inherent and therefore part of the discourse on governing te taiao.

Additionally, there have been decisions to move towards other system changes over the last 5 years including:

- establishment of the Climate Change Commission. An institution birthed in 2019 from the amendments to the Climate Change Response Act 2002;
- amendments to the Environmental Reporting Act 2015 to strengthen the role (duties and functions) of Statistics New Zealand;
- introduction of a fast-track consent process for projects of scale that support recovery form COVID-19;
- establishment and role of a new urban authority Kāinga Ora
- regulations under the Waste Minimisation Act 2008 to manage the use of plastic bags and micro-beads;
- upcoming changes to the Plant Variety Rights Act 1987;
- amendments to Te Ture Whenua Māori Act 1993;
- review of the Māori Fisheries At 2004;
- and while still in place, amendments to the RMA, and changes to national directions within it.

Included within this change is the emergence of how and where consideration and inclusion of te ao Maaori, and Maaori perspectives, values and interests in policy are enabled. It could be viewed that this emergence is by in large from statutory directions within te Titiri o Waitangi settlement legislation to authorities that exercise duties and powers in other legislation, and persons who practice within them.

Environmental Issues

The *Environment Aotearoa 2019* identified nine evidential issues impacting Aotearoa New Zealand's environment.

These are:

- Issue 1 - Our native plants, animals, and ecosystems are under threat
- Issue 2 - Changes to the vegetation on our land are degrading the soil and water
- Issue 3 - Urban growth is reducing versatile land and native biodiversity
- Issue 4 - Our waterways are polluted in farming areas
- Issue 5 - Our environment is polluted in urban areas
- Issue 6 - Taking water changes flows which affects our freshwater ecosystems
- Issue 7 - The way we fish is affecting the health of our ocean environment
- Issue 8 - New Zealand has high greenhouse gas emissions per person
- Issue 9 - Climate change is already affecting Aotearoa New Zealand

Based on this report, Aotearoa New Zealand's natural resources are declining and degrading in qualities due to human activities.

Future System

At the writing of this report, the Natural and Built Environment Bill and Spatial Planning Bill were being introduced. It is envisioned that in 2023, we will see the introduction of the Climate Adaptation Bill and all three Acts together will replace the RMA.

The change is extensive and will bring with it both opportunity and challenges for Waikato-Tainui. The aim of these changes is to improve environmental outcomes and enable use, development and subdivision to be undertaken within environmental limits. There will be a large focus on urban development, alongside provision for resilience to climate change and other natural hazards.

Through spatial plans, there is a search for the alignment of planning and regulation with infrastructure planning and its funding.

The literature and communications supporting these changes has indicated a large shift towards iwi and hapuu involvement to provide for greater recognition of te ao Maaori and maatauranga Maaori, and enhancements in give effect to te Tiriti o Waitangi principles such as partnership, protection, and participation.

When viewed in the context of existing institutional processes and arrangements, the shift will likely need significant resourcing by iwi and hapuu to participate but also in developing the capacity and capability because of the breadth of involvement needed, and the expertise sought.

In time, there will eventually be a process and management system in place for the allocation of resources, and this will be required by its nature to have addressed the rights and interests of Maaori, albeit not necessarily supported by all Maaori.

There will need to be clear objectives for Waikato-Tainui that identify and address the priorities and immediate to mid-term actions, whilst also cognisant of being effective and efficient in the other areas where rights and interests and exercise of mana whakahaere are required, to ensure these are not lost.

Digital Transformation

The new resource management system will mean more collaborative planning within a region, and across regional boundaries, and will require data from multiple agencies and groups to be easily moved between systems.

The Ministry for the Environment is investigating how digital technologies can achieve this, and more generally how to make it easier for the public and the resource management sector to access information and perform transactions.

Their report *Digital Transformation of the Resource Management System* has focused on governments in the United Kingdom (largely England), European Union, North America, and Australia. Below is a non-exhaustive list of digital

initiates intended to aid understanding of the opportunities identified through the participants:

- Access to planning authority's planning consents/applications
- Digital principles for planning practice
- Digital city model
- New approaches to consenting
- Efficient software procurement
- Funding innovation
- Legal status of environmental data
- Land registry / subdivision
- Open data / use of data
- Public participation in planning
- People and skills
- Reward success
- Strategic approach and vision for the system

In referring back to the *Environment Aotearoa 2019* report, the concluding chapter *Towards a better understating of our environment*, the chapter identifies five challenges;

1. Understanding our environment;
2. Features of the environment;
3. Making informed decisions;
4. The knowledge system and environmental reporting; and
5. Strengthening our knowledge and reporting systems.

From the *Understanding our environment* section in the chapter:

> *"The environmental system operates at many different scales and has innumerable dimensions, intricacies, and interdependencies – these are nature's premises that we cannot change. But we can, through understanding our environment, adjust our actions and decisions to improve the way we manage and protect the environment that supports and sustains us*." (Ministry for the Environment, 2019, page 106)

There is a recognition in this statement that the complexities in the ecological functioning of the environment cannot be managed. But through understanding, persons who carry out activities, duties, functions and exercise of power under resource management legislation, can manage the actions and decisions within this complexity to minimise impacts to, and possibly restore, the environment.

From the *Making informed decisions* section in the chapter:

> *"….Making informed decisions about those actions depends on being equipped with relevant data and accurate knowledge.*
>
> *Environmental stewardship – the responsible use and protection of the natural environment – requires a holistic approach to decision-making at both a national and individual level. A well-functioning reporting system should bring data and knowledge together so decisions:*

- *can be made on the basis of authoritative data and knowledge, using common measures and language*
- *are as effective as possible and consider the whole environment (ideally bringing co-benefits and avoiding unintended consequences on another part of the environment)*
- *are made in a way that allows people to comprehend their longer-term and cumulative consequences*
- *reflect the values that are important to us (and relevant information is conveyed in a way that everyone finds useful and easy to understand)*
- *are able to be made around local action and decision-making*
- *support Māori, in particular allowing a voice for the concerns of kaitiaki and nature."[24]*

The report concludes that it is about having enough information to act, and that access to information to make informed decisions will ensure we (people) are responsible in the use, and protection of te taiao. With this said, the report recognises that there are gaps in information. It is identified that there is missing data that prevents knowing what is happening where and when, and limited knowledge about effects of human activities, and that this results in an incomplete understanding on the impacts on people's wellbeing.[25]

It is advised on the Ministry's website that the next step for digital enablement is to work with hapuu/iwi/Maaori to establish priorities and how the Ministry can work with Maaori to achieve those priorities.

Mana Whakahaere

The Waikato-Tainui Environmental Management Plan *Tai Tumu Tai Pari Tai Ao* describes Mana Whakahaere as:

"…the authority that Waikato-Tainui has established in respect of the Waikato-Tainui rohe over many generations. Mana whakahaere entails the exercise of rights and responsibilities to ensure that the balance and mauri (life force) of the rohe is maintained. It is based in recognition that if we care for the environment, the environment will continue to sustain the people. In customary terms mana whakahaere is the exercise of control, access to, and management of resources within the Waikato-Tainui rohe in accordance with tikanga. For Waikato-Tainui, mana whakahaere has long been exercised under the mana of the Kiingitanga. Waikato-Tainui managed its resources, including the fisheries and lands, in a sustainable manner, guided by maatauranga, tikanga and kawa."

In addition to the Crown Iwi Accords, joint management agreements, and other mechanisms achieved through the 1995 and Waikato River settlements, the new/future system is

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[24] MfE, 2019, page 107

[25] MfE, 2019, page 107.

enhancing the mana whakahaere of Maaori through a number of mechanisms such as, but not limited to:

- Water Services Entities Act
  - Recognition of te Tiriti o Waitangi principles and Te Mana o Te Wai
  - Participation and membership on Regional Representation Groups
- National and Built Environment Act
  - Give effect to te Tiriti o Waitangi principles
  - Membership on regional planning committees
  - Inclusion of maatauranga
  - Participation in developing environmental bottom lines, limits and targets
  - Implementation localised definitions/expressions of Te Oranga o te Taiao and Te Mana o Te Wai
  - Continued role in resource consent applications and assessments
  - Continuance of Mana Whakahono a Rohe
- Spatial Planning Act
  - Includes the above
  - Membership on cross-regional planning committee
  - Protection of customary activities and marine titles
  - Protects Te Ture Whaimana o Te Awa o Waikato in statute
  - Protect Maaori lands

- Climate Adaptation Act
  - Establishment of the Māori Climate Platform and participation in strategies, policy and action plans for adaptation and mitigation
  - Recognition of te Tiriti o Waitangi principles
  - Maaori led climate change initiatives

The purpose for discussing mana whakahaere is based on the indication that there will be a significant increase in, and need to, participate in existing and upcoming processes and projects both iwi-led and externally driven. Participation will be extensive.

These changes arising from the new and future system(s) will likely require Waikato-Tainui to advocate and manage potential and actual consequential changes to settlement legislation, and the rights and interests of Waikato-Tainui. The recent Waitangi Tribunal proceedings for WAI 2358, and its interim report on Māori Appointments to Regional Planning Committees, foreshadows the on-going necessity for the iwi to continue to advocate for the rights and interests of Waikato-Tainui.

For this reason, consideration towards sharing and/or devolving areas of mana whakahaere of Waikato-Tainui to, and between, hapuu, marae and other iwi constructs (e.g. clusters, collectives, or management groups) should be further explored.

Unlocking Whenua Maaori

The underutilisation of Maaori owned land is a significant issue for the primary sector, the regions, and the national economy,

but also for whaanau to go home, (re)connect and provide, access to, housing and generate an income.

The Natural and Built Environment Act has sought to integrate/connect with processes of, and decisions arising from within, Te Ture Whenua Māori Act 1993 to better recognise whenua Maaori.

Notwithstanding this change in the system, unlocking the potential of whenua Maaori requires an understanding of key components of Maaori values and maatauranga, assets/taonga, and whaanau level governance and decision-making.

Government agencies such as Te Puni Kōkiri and Ministry for Primary Industry have/are investing in programmes and initiatives to support greater productivity from whenua Maaori.

Governing te taiao at the micro/whaanau level, as well at an iwi/Crown level, should be explored, to operate alongside aligned government agency support to whaanau that help to understand the full characteristics and constraints of their whenua, but also in building governance and management capability within whaanau trusts or feasibility studies.

4. RAPID GROWTH OF DATA AND DATA ECONOMIES

Data and information flow, (in)equity in data access, and involvement in an emerging new economy.

With the capturing, grouping and categorising of data used to transform business and agency practices, a clear role for iwi Maaori in the control and management of iwi Maaori specific, and derived, data and information (includes maatauranga), needs to be defined at all scales (tangata, whaanau, marae, hapuu iwi). The emergence and growth of a knowledge/digital economy proffers an opportunity.
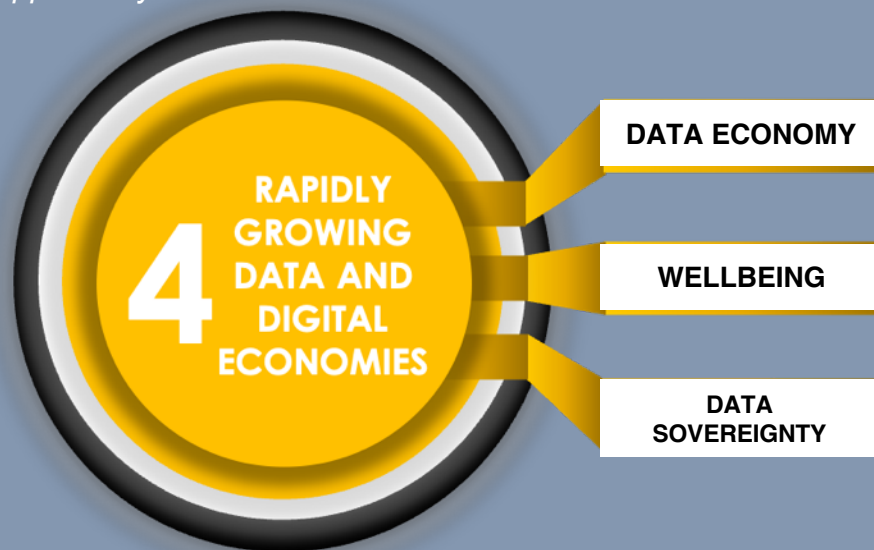
4 RAPIDLY GROWING DATA AND DIGITAL ECONOMIES

- DATA ECONOMY
- WELLBEING
- DATA SOVEREIGNTY

CROSSCUTTING TRENDS

- **ECONOMIC DRIVEN ACTION / RE-ACTION**
- **GOVERNING TE TAIAO**
- **INCREASING AUTOMATION AND AUTONOMY OF AI**

WHAT THIS MEANS FOR WAIKATO-TAINUI

- **Tangata**
  Will continue to be impacted most heavily in their every day lives with the encroachment of data capture and data driven decisions across all spheres of their online engagement. The individual access to phones enhances isolation and the role of the individual, apart from the whaanau.

- **Whaanau**
  Will be heavily influenced by data driven economies within all parts of their lives. Those without access to technology will be disadvantaged.

- **Marae**
  Similarly to whaanau, Marae will be impacted most by the data driven influences in their lives. The ability to access data to assess the risks to their whenua and infrastructure and for management practices, poses a big opportunity for marae to develop at pace.

- **Hapuu**

  Will play a role in developing and growing their knowledge economy through collective opportunities within the digital economy, utilising and controlling their koorero and hiitori across the education and environmental micro-economies.

- **Iwi/Organisation**

  Data will transform the way the iwi operates, enabling enhanced decision-making power in all areas. There will need to be considerable strategic development around Waikato-Tainui protocol for managing tikanga, reo and maatauranga in this emerging data space. Maintaining data sovereignty will be key, but only useful where the data is used, valued and influencing change.

- **Taiao**

  Access to greater environmental monitoring data within taiao will enable and enhance the role of kaitiaki as well as provide greater understanding of the impact that resource users are having on te taiao.

INSIGHTS

Data is big and will continue to drive growth, power and control into our futures. Because of this, ensuring that the iwi has control of its data and continues to show leadership through data sovereignty discussions, will be critical. The value of technology is huge and when accessible to all, can enable great strides in progress. Around the globe, while technology and innovation drive prosperity, the lack of such capabilities is a major hurdle for developing countries to draw level with developed nations. While the latter have made high levels of investment commitments going forward, e.g. in quantum computing technologies and cybersecurity, such levels are simply not within the reach of the those without. [26] Technology has the ability to further entrench disparity with indigenous peoples being unlikely to share equitably in these benefits.[27]

Data in and of itself is a currency and an economy. Access to it and the trading of it provides leverage and power to those with access. Iwi need to ensure that they have such access and are in control of how they use that data for the benefit of Waikato-Tainui and te taiao.

[26] Roland Berger, Trend Compendium 2050: Six megatrends that will shape the world. December 2020.

[27] Kukutai, T. & Walter, M. 2021. Indigenous data sovereignty. In J. Gray & L. Bounegru (eds), The data journalism handbook 2: Towards a critical data practice, 2nd ed (pp. 67 - 77). European Journalism Centre and Google News. https://library.oapen.org/handle/20.500.12657/47509

The ever-increasing data that is being collected, about people, and about (and on) the environment, provides both opportunities and barriers, depending where Waikato-Tainui (the organisation) is on the data continuum. If Waikato-Tainui (the organisation and people) are holders and owners of that data, it can find ways in which to use this in accordance with tikanga, and where appropriate, to its advantage to achieve aspirations and address the challenges. If not holders nor users of that data, there is potential that the iwi will be on the losing end of the continuum, seeing Waikato-Tainui data and information used by others to derive value and drive growth based on that data.

One of the essential ways in which the iwi can remain fully engaged in the data economy is by moving to solutions with greater interoperability and by consistently seeking external support to ensure technology solutions are always pushing to be the most advanced at each critical decision-making junction. Maintaining old systems where the best value cannot be derived from the data, is counter-productive. It also inhibits growth, partnerships and the ability to be responsive and adaptive in this highly fluid and ever-changing economy.

With data being integral to all areas of our lives both as individuals and organisations, being in control of and intentional about data and decision making will be key. Leading in this

space will give a considerable advantage to Waikato-Tainui, both as the iwi organisation and as people, and ensure that tribal members are not left behind. Nor that the data is being used by others to create solutions for Waikato-Tainui, as opposed to having solutions defined by the iwi. Risks posed include the appropriation of cultural knowledge and intellectual property; the exploitation of land and other natural resources and more.[28]

Maatauranga is highly valued and highly sought after. Therefore protocols and tikanga for whaanau, hapuu and marae to remain in control of their own stories, koorero and hiitori is an essential part of this journey to mana motuhake. Ensuring Waikato-Tainui is also influencing how stories are being told with the data that they share, is also critical.

Moving to a knowledge economy not just a data economy

Success factors include the ability for organisations and companies to adapt and evolve into the digital space. The existing organisations that move into the digital space, consistently out perform their less digitally capable cohort, regardless of their tenure in an industry. Research has found that 'legacy' companies that invest and build digital capacity are quickly catching up with digital innovators who were previously leading in their respective industries.[29] Equally, growth will be

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[28] Ibid n 25.

[29] https://www.bcg.com/publications/2022/rise-of-digital-incumbents-building-digital-capabilities

increasingly harder to achieve, amidst continued industry attack for those that cannot transform and keep pace.

Data Sovereignty

Mention of the Metaverse in both Section 2 and 5 of this report highlights its importance. Data however, represents the power and the engine for the Metaverse. The infrastructure that is evolving to support data storage (both cloud and edge computing[30]) requires deeper levels of understanding and considerations on their impacts to data sovereignty. Where unknowns are increasingly evident, this necessitates a level of fluidity that will push through comfort levels and require evolving assessments of values, tikanga and more.

Security, identity, and privacy concerns will be ever increasing along with Waikato-Tainui relevant data. These risks are greatly magnified and pose a real threat to those without at least an entry level understanding of the evolving data and digital economies. The most vulnerable include kaumaatua and tamariki who unknowingly may expose themselves or their data to risk.

Te Mana Raraunga – Maaori Data Sovereignty Network advocates for Maaori rights and interests in data. They assert and advocate a competing perspective to the current mainstream and often legally derived view that 'Data Sovereignty typically refers to the understanding that data is subject to the laws of the nation within which it is stored.'[31]

Te Mana Raraunga advocate that:

- Indigenous Data Sovereignty perceives data as subject to the laws of the nation from which it is collected.

and

- Maaori Data Sovereignty recognises that Maaori data should be subject to Maaori governance. Maaori data sovereignty supports tribal sovereignty and the realisation of Maaori and Iwi aspirations.

These fundamentals should form at least part of a baseline framework and will influence the direction that Waikato-Tainui take in strengthening their own tribal perspectives on data sovereignty, use and storage.

Ownership of data however important it is as a goal, should not supersede the overarching goal of deriving value from that data to make change, inform decisions and increase understanding.

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[30] Edge computing, also known as multi-access edge computing or mobile edge computing, will play an important role in driving the computing power required to run the metaverse. At its core, edge computing enables data to be captured, stored, and processed locally across smart devices and local networks rather than in the cloud.

https://www.mckinsey.com/~/media/mckinsey/business%20functions/marketing%20and%20sales/our%20insights/value%20creation%20in%20the%20metaverse/Value-creation-in-the-metaverse.pdf

[31] https://www.temanararaunga.maori.nz/

5. INCREASING AUTOMATION & AUTONOMY WITH AI

Advancement in technology and the use of artificial intelligence will revolutionise the world we know. Continuous rise and evolution of artificial intelligence and autonomous systems will result in opportunities that will likely test our values systems and tikanga Maaori e.g. augmented realities. Jobs will be replaced and new ones evolve with increases in outputs and productivity across the board.

5 INCREASINGLY AUTONOMOUS WITH AI

MICRO-LEARNING

OPPORTUNITY

TIKANGA
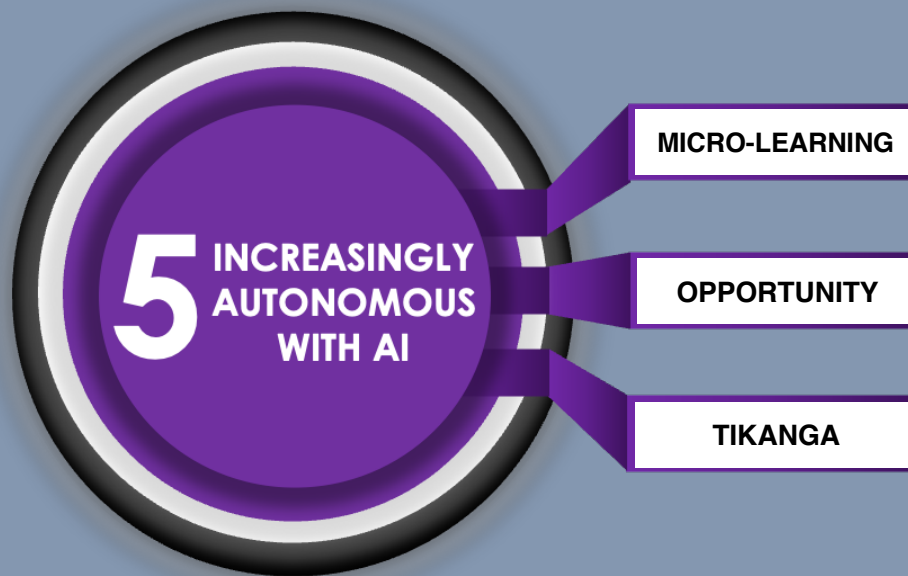
CROSSCUTTING TRENDS

- **GOVERNING TE TAIAO**
- **RAPID GROWTH OF DATA AND DATA ECONOMIES**
- **PRIORITISING WELLBEING**

WHAT THIS MEANS FOR WAIKATO-TAINUI

- **Tangata**
  Will increasingly have opportunity to control their own career pathways, and adapt this to the needs of the job market impacted by AI.

- **Whaanau**
  Will be impacted most by the changes that AI will be causing throughout employment, daily tasks and online experiences. Some of these changes will mean positive change for whaanau seeking new opportunities. Those without access to technology will be disadvantaged.

- **Marae**
  Similarly to whaanau, marae will be impacted most by the shift around their marae practices impacted by automation. These impacts will be felt less for those less connected marae.

- **Hapuu**
  Will be poised to take lead and support conversations around evolving tikanga in these emerging domains.

- **Iwi/Organisation**
  Will be impacted through shifting practices wherever possible to automation, and harnessing the opportunities this brings for more meaningful and skilled mahi for its staff. Will also need to lead discussions around evolving tikanga.

- **Taiao**
  AI will mean many facets of environment management and monitoring will be challenged through human replacement. Understanding how Waikato-Tainui assessments and maatauranga fit in this context and leading innovative solutions that advance interaction with te taiao, rather than reduce it.

INSIGHTS

With our future moving towards us at an ever-increasing pace, advances in autonomous systems and technology will be becoming more and more evident as we approach 2050. The metaverse which was fledgling at best is now becoming a reality and will be tomorrow's internet. Ipsos note that the Metaverse will be so impactive as '*it is not a distinct technology or merely virtual worlds, but a technological ecosystem that offers seamless and permanent, connected experiences between real and virtual worlds - in every aspect of our life'.*[32]

Particularly in the field of AI, an ever more evident number of technologies are being lined up and/or are coming out of the pipeline. AI experts predict a near limitless progression of the capabilities of AI technologies and such powerful developments are faced with enthusiasm mixed with concern for human values and agency.[33]

Pushing through with technology assisting us to be more productive, efficient and replacing tasks/jobs, through to formal integration and absorption of lives into it. Values and human decision making will be the last frontier and where social license for adopting innovation will be pushed to its limits. The extent of those limits is not yet known to us.

Forming a Waikato-Tainui view

Ensuring that Waikato-Tainui is at the forefront of discussing the acceptance of these autonomous innovations and how they are likely to play a role in both protecting, preserving, enhancing and strengthening tikanga, taonga, maatauranga and reo will be critical. Understanding the potential and value that can be derived from these innovations, in this context, will be critical in making decisions around adoption, integration or avoidance.

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[32] https://www.ipsos.com/en-nz/welcome-metaverse

[33] Roland Berger, Trend Compendium 2050: Six megatrends that will shape the world. December 2020.

Equally, understanding the role of such innovation on individual, whaanau and tribal businesses level will ensure that as a collective, no one is left behind, nor increase in inequality[34] for tribal members. Prioritising ensuring access to digital infrastructure, at marae and at home will help to avoid a widening of a gap in the digital haves and have nots.

Impacts on employment

With the ability for many of the traditional jobs and types of employment likely to change there will likely be significant impact on training, traditional learning pathways and ways in which Waikato-Tainui are able to support whaanau through employment. Ensuring that the iwi are thinking about how these changes in employment and training are readying its tribal members for their likely futures, will be critical to ensuring the wellbeing of whanau moving forward.

There is an accelerated need for companies to become bionic—not simply to make standalone digital improvements, but to intentionally combine human and technological capabilities.[35] This includes using new and innovative technologies powered by data and AI being used in new and innovative ways by humans to achieve great outcomes. Many of today's problems will be solved and become routine automated actions, leaving humans with time and space to solve new problems and pursue solutions for emerging and more complex issues that Aotearoa New Zealand will be facing as well as increase productivity.[36]

AI will drive mass pattern recognition, inform predictions, enable exponential learning, and unlock the ability to make better, faster decisions.

[34] Ipsos Game Changers.

[35] https://www.bcg.com/capabilities/digital-technology-data/bionic-company

[36] https://www.bcg.com/capabilities/digital-technology-data/bionic-company

Metaverse Opportunities

Opportunities with growth towards Omniverse and Metaverse[37] based solutions, technologies and markets, will lead through to transformation in the digital and AI space and this will bring with it challenges and values discussions as this next iteration of the internet evolves. As advanced as this world and innovation may seem, early indications are that its brings the same challenges that exist today around diversity and gender in leadership. With the focus currently on developing standards and a framework for this new world being one of exclusivity, the likelihood of iwi and Maaori being absent from critical decisions and discussions around controls and values based metrics is highly likely.

Likewise for these new worlds to be created absent of cultural influences or by cultural misappropriation is almost a given, unless intentional leadership occurs in this space. In organisations shaping metaverse standards, 90 percent of leadership roles are held by men.[38] Although the data on ethnicity is scarce thus far for the Metaverse, evidence does provide us with similar experiences of bias in the tech and software development world. These biases exist because they are developed by humans whose biases are reflected in their products and solutions or reflect their own cultural, gender or other biases.

To support a presence in this space and the development of metaverse solutions where Waikato-Tainui is visible, there will need to be innovators, creators, developers and leaders. As within the environment, education and business sectors, there will need to be leadership capacity to ensure the advancement of key discussions defining use, controls and parameters of the metaverse.

The effects of this emerging space will be evident within the next five years, but will be transformative within the 10-15 year planning phases.

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[37] Ibid n 34.

[38] An alternative view is that in a virtual space many of the biases that are carried through visual association or personal appearance are no longer relevant.

https://www.mckinsey.com/featured-insights/diversity-and-inclusion/even-in-the-metaverse-women-remain-locked-out-of-leadership-roles [38]

6. PRIORITISING WELLBEING

Individual and collective health and wellbeing, and how we manage this now and into the future. The global aging population (although inverse for Waikato-Tainui) and greater research and understanding in this area, will likely result in future focus on aging well and retaining individual wellbeing later into life. In addition, our changing climate may increase environmental related illnesses, as well as new and emerging diseases arising.

6 PRIORITISING WELLBEING

MENTAL HEALTH

GOVERNANCE

CHANGE

CROSSCUTTING TRENDS

- **RESPONDING TO A CHANGING CLIMATE**
- **RAPID GROWTH OF DATA AND DATA ECONOMIES**
- **INCREASING AUTOMATION AND AUTONOMY OF AI**

WHAT THIS MEANS FOR WAIKATO-TAINUI

- **Tangata**
  Will become more aware of the impacts that the changing world around them is having on their own wellbeing. They will also have access to increasingly changed wellbeing opportunities that arrive in the hauora space.

- **Whaanau**
  Wellbeing of whaanau will be impacted most by the resulting effects of other trends and stressors detailed in this report. Mental health and changes in employment as well as increased screen time and online influences are likely to increasingly compromise wellbeing. The large changes occurring for Maaori health governance and provision are likely to see significant changes for how Waikato-Tainui whaanau experience health and wellbeing service provision.

- **Marae**
  With whaanau being at the heart of marae, the human impacts above will in turn impact on marae functions and

services. Higher profile or more accessible marae may continue to be used and seen at the heart of hauora service provision.

- **Hapuu**

  May play an increasing role in health service provision as the emerging Maaori health model grows. This opportunity may enable mana motuhake for hapuu through provision of their own hauora services.

- **Organisation**

  The large changes occurring for Maaori health governance and provision are likely to see significant changes for how Waikato-Tainui as an organisation, and service provider, operate in this space.

- **Taiao**

  The prioritisation of human wellbeing as Aotearoa New Zealand moves into a period of uncertainty, could result in a decrease in prioritisation of environmental projects.

INSIGHTS

Aotearoa New Zealand, like the rest of the world, has faced some challenges with the ongoing presence of COVID-19. Our response was and will continue to be driven by global information and evolving research as we followed other countries where the pandemic was managed, or not, before it arrived on our shores. Having experienced the COVID-19 pandemic, Aotearoa has seen first-hand, the impacts to the health system and the vulnerability where pressure on the system emerges at pace. Other earlier 21st century epidemics: SARS, ZIKA, MERS, Ebola et al. had shown us the likelihood and the impact that could occur, but essentially Aotearoa was a bystander to these.

Increasing health imperative

Health issues for Maaori continue to be disproportionate[39] and the focus on improved outcomes for Maaori in Aotearoa remains a priority. With the introduction of the Maaori Health Authority, Te Aka Whai Ora[40] is responsible for ensuring the health system works well for Maaori by:

- leading change in the way the entire health system understands and responds to Maaori health needs
- developing strategy and policy which will drive better health outcomes for Maaori
- commissioning kaupapa Maaori services and other services targeting Maaori communities
- co-commissioning other services alongside Health NZ

[39] https://www.healthnavigator.org.nz/clinicians/m/m%C4%81ori-health-overview/

[40] New Zealand Government. 2022.
https://www.teakawhaiora.nz/

- monitoring the overall performance of the system to reduce health inequities for Maaori.[41]

He Whatu Ora works alongside Te Aka Whai Ora and is responsible for improving Maaori health outcomes and equity through all of its strategic and operational functions at national, regional and local levels.[42]

Similarly to the Taiao space, increased Maaori leadership and partnership is innate for the health authority. The establishment of iwi-Maaori Partnership Boards will have decision-making roles at a local level, and jointly agreeing local priorities and delivery. This will have a clear connect for rohe based iwi authorities such as Waikato-Tainui and the significance of this role may grow and change over the coming 5 years, as the system is established.

Pressures such as the aging population and new health challenges such as antimicrobial resistance and future pandemics will all test the health system and challenge new systems such as the Maaori Health Authority which will still be establishing its own Maaori centric systems. The COVID-19 pandemic revealed and intensified existing health challenges around the burden of chronic illness and mental health difficulties.[43] But it has also emphasised the importance of social and economic determinants of health. This trend however offers many opportunities to integrate preventative healthcare and precision healthcare through access to data and technologies for the advancement of wellbeing and better outcomes.

Mental health

With increasing global awareness of events in response to these trends – climate fears, increased screen time and reduced human interaction, changes in jobs, careers, and life direction – all pose mental health risks.

Health professionals warn the constant threat of illness, social isolation, economic worries, grief from family separation and other pressures imposed by Covid-19 have both compounded the distress of those who were already vulnerable to mental health problems, and caused people to experience symptoms of conditions such as anxiety and depression for the first time.[44]

[41] New Zealand Government. 2022. https://www.futureofhealth.govt.nz/maori-health-authority/
[42] New Zealand Government. 2022. https://www.tewhatuora.govt.nz/
[43] CSIRO. 2022. Our Future World - Global megatrends impacting the way we live over coming decades. https://www.csiro.au/en/research/technology-space/data/our-future-world

[44] Shaun Robinson, Chief Executive of the Mental Health Foundation in https://www.nzherald.co.nz/nz/great-minds-nzs-mental-health-crisis-more-kiwis-struggling-with-wellbeing-since-covid-research-reveals/Q4HT7GCKTBYYGH57RBT6PW55PI/ 22 April 2022.

COVID-19 and the looming recession are noted to have had had significant impact on mental health and created new barriers for people already struggling with anxiety and depression.[45] An increase of up to 25% in rates of depression and anxiety post COVID[46] is of real concern and requires intervention in the short term to curb this trend, rather than see it exacerbate. Recent growth in working from home and the blurring of work and life boundaries which continues at a vastly greater rate than pre-COVID times, is stretching whaanau in ways not experienced before. Similar to the economic impacts of COVID that are still being felt, the changes in wellbeing that have lingered long after a return to work, or in fact the realization that this 'new normal' in work life balance in fact be permanent, will challenge peoples wellbeing in both positive and negative ways.

Kaumaatua

The trend in increasingly age-related diseases such as dementia points at a strong increase in the need for cost-

intensive care. An increasing number of professional caregivers are required to support the growing number of older people and their complex care needs.[47] This type of care is in New Zealand considered as challenging and a low paid role with a high turnover rate.

For Maaori, those requiring care are more likely to be living with others and dependent on whaanau for support and to play those caregiving roles. This increasing pressure and need for skilled carers to support whaanau and their kaumaatua, will be an increasing area for supporting the Waikato-Tainui demographic into the future. Where there are needs based reasons for whaanau to choose full time residential care, the lack of whaanau or te ao Maaori focused aged care facility options is evident[48] and an area where the iwi and its investment arm may continue to consider forecasting for this need ahead.

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[45] https://www.kff.org/coronavirus-covid-19/issue-brief/the-implications-of-covid-19-for-mental-health-and-substance-use/
[46] World Health Organization, 2022. COVID-19 pandemic triggers 25% increase in prevalence of anxiety and depression worldwide. https://www.who.int/news/item/02-03-2022-covid-19-pandemic-triggers-25-increase-in-prevalence-of-anxiety-and-depression-worldwide#:~:text=Wake%2Dup%20call%20to%20all,mental%20health%20services%20and%20support&text=In%20the%20first%20year%20of,Health%20Organization%20(WHO)%20today.

[47] Roland Berger, Trend Compendium 2050: Six megatrends that will shape the world. December 2020.
[48] Health Quality and Safey Commission New Zealand. 2021. Report: Older Māori and aged residential care in Aotearoa | Ngā kaumātua me te mahi tauwhiro i Aotearoa. https://www.hqsc.govt.nz/resources/resource-library/report-older-maori-and-aged-residential-care-in-aotearoa-nga-kaumatua-me-te-mahi-tauwhiro-i-aotearoa/

Advancing technology

In addition to the role that data will play across all trends, health and wellbeing will be no different. Data use, ownership of that data that is personal to individuals, as well as maintained to gain regional and iwi-based statistics and trends, will see data being used to support illness and disease prevention, treatment and identify causes. Waikato-Tainui should play a significant role in supporting data discussions for Maaori to better understand what data is being used for, and for the benefit of whom.

Poor wellbeing on the rise

The percentage of respondents returning scores of poor or very poor emotional wellbeing has been increasing steadily since 2020.
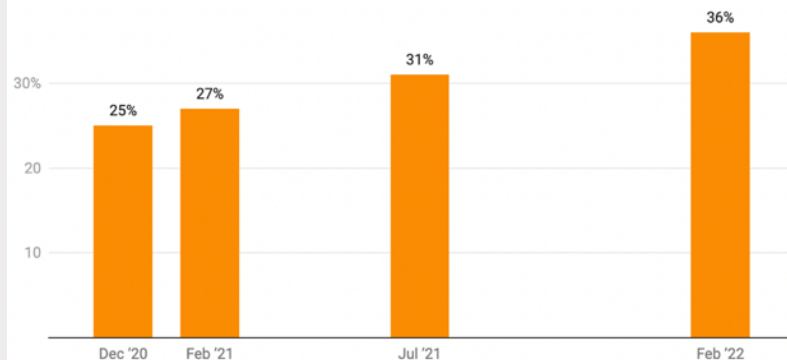
Based on a survey of 1004 people in February 2022.
Categories of wellbeing are based on survey scores: Very poor=0-6, poor=7-12, okay=13-18, good=19-25.
Source: Ipsos | Mental Health Foundation • Created with Datawrapper

[49]Treatments are likely to advance and emerge quickly as new technologies continue to advance. Healthcare and medical technology predictions and expectations, are likely to include cures and highly advanced robotics. Not all of these will materialise but cell and gene therapies are some of the most promising.[50]

Climate

Alongside this, Aotearoa New Zealand are increasingly facing climate change as a health risk as noted earlier in Section 1. Now and towards 2050, global access to medical care and funding will remain highly inconsistent, further intensified by the increasing challenges faced due to Aotearoa New Zealand's changing physical environment. Emergency responses will increase in frequency and intensity alongside climatic changes. The needs and demands of people will in turn shift, as will available resources and priorities in response.

Climate change and ecological degradation are likely to drive poorer health outcomes due to "decreased water, air, and food quality". Equally, changes in disease through habitat changes and habitat loss driving potential zoonotic disease outbreaks. [51]

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[49] Ipsos. Mental Health Foundation. Poor Wellbeing on the Rise. 2022.
https://www.ipsos.com/en-nz/Mental_Health_2022
[50] https://www.mckinsey.com/industries/life-sciences/our-insights/eight-imperatives-for-launching-cell-and-gene-therapies

[51] Capita. 2022. 5 Questions from Global Trends 2040
https://www.capita.org/capita-ideas/2021/4/14/5-questions-from-global-trends-2040?gclid=Cj0KCQiAm5ycBhCXARIsAPldzoVHSuZUYOth5evV0dy0MynDc_W3eGL8RsGmdBcOsFPe8YIqGbSDNuIaAmTJEALw_wcB

7. CHANGING FACE OF EDUCATION

Online, accessible, micro/short courses, to align with the changing workforce and markets. The influence of the former trends will direct changes in the demands from education (focus on te taiao, health, IT and digital technologies) and how we undertake training. Shorter focused training, more likely to be off campus, enabling a more transient learner with a fluid career. Our learners will need to carry a digital footprint and possess enhanced soft skills like problem solving and critical thinking, evolving into new jobs not yet known.
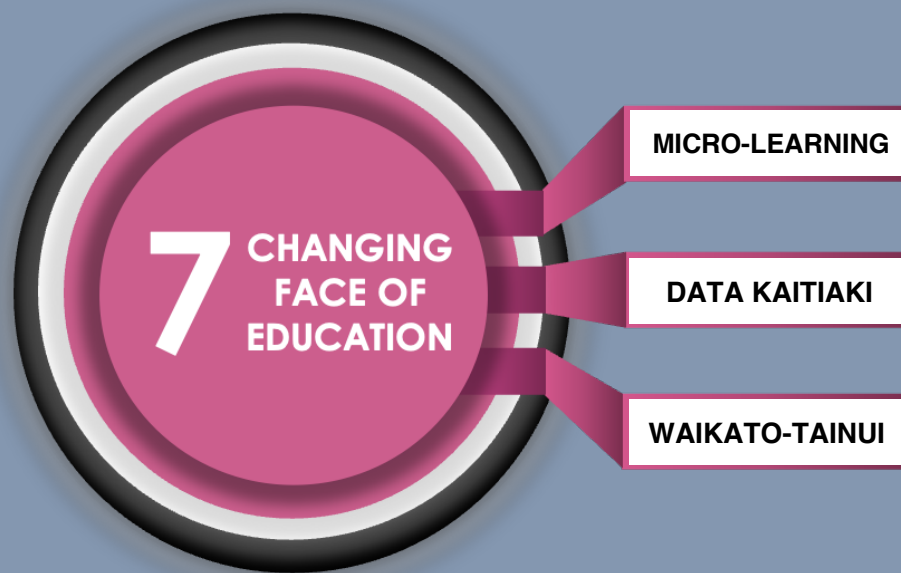
7 CHANGING FACE OF EDUCATION

- MICRO-LEARNING
- DATA KAITIAKI
- WAIKATO-TAINUI

CROSSCUTTING TRENDS

- **RESPONDING TO A CHANGING CLIMATE**
- **RAPID GROWTH OF DATA AND DATA ECONOMIES**
- **INCREASING AUTOMATION AND AUTONOMY OF AI**

WHAT THIS MEANS FOR WAIKATO-TAINUI

- **Tangata**
  Will see big changes in available training opportunities and see learners start to see themselves (as Waikato-Tainui) emerge within their own curriculum.

- **Whaanau**
  May be impacted most by the ongoing shift in educational options becoming available. Moving employment opportunities will be reflected in these options, that will enable whaanau to advance their pathways in new and innovative ways.

- **Marae**
  Similarly to whaanau, Marae will have opportunities to both be supported in training pathways, and contribute to those pathways with tailored training. Identifying where marae have the capacity to lead in this space.

- **Hapuu**
  May have opportunity to play a lead role in sharing knowledge through these emerging training pathways, as cultural, maatauranga, tikanga pathways increase in demand.
- **Iwi/Organisation**
  Shifting trends in career and employment opportunities will see huge opportunity to create bespoke training using micro-credentials and tailored training modules that support tribal aspirations, and enable Waikato-Tainui centric curriculum to be delivered across both kura kaupapa and mainstream learning.
- **Taiao**
  Opportunities to advance bespoke Waikato-Tainui educational and career opportunities for working in te taiao.

INSIGHTS

Similarly, to other trends above, this trend is and will continue to be heavily influenced by parallel trends. Career pathways and areas of interest will naturally follow the trends that are forming around us. As digital and data economies emerge, so too will many professions, jobs and roles that do not currently exist. The future of work is the future of education.[52]

Harnessing technological opportunities

In the BERL report, it is known to Waikato-Tainui that the current education system is failing Waikato-Tainui rangatahi[53] so these emerging trends and the evolving education system that will continue to emerge, presents an opportunity for the iwi to play a significant role in recreating a system that is tailored for and works to the strengths of rangatahi.

The trend towards online learning has been intensified and hastened by COVID. The increasing drivers of digital economies and AI are driving alternative training pathways, while climate responses are driving new development pathways for innovation and subsequent employment pathways.

Along with the need to adapt these learning pathways, traditional methods of learning will be revisited and stretched to adapt through multi-faceted micro-learning. Digital credentials, badges & certifications are becoming mainstream more dynamic and more transferable, allowing students to showcase their skills anywhere online.

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[52] https://www.bcg.com/publications/2020/governments-must-fix-skill-mismatch-post-covid

[53] BERL, Waikato- Tainui, The Southern Initiative and Tokona te Raki: Maaori Futures Collective of Te Ruunanga o Ngaai Tahu. (2022) HE AWA ARA RAU: A

JOURNEY OF MANY PATHS. The Journey of our Rangatahi Maaori Through Our Education System.
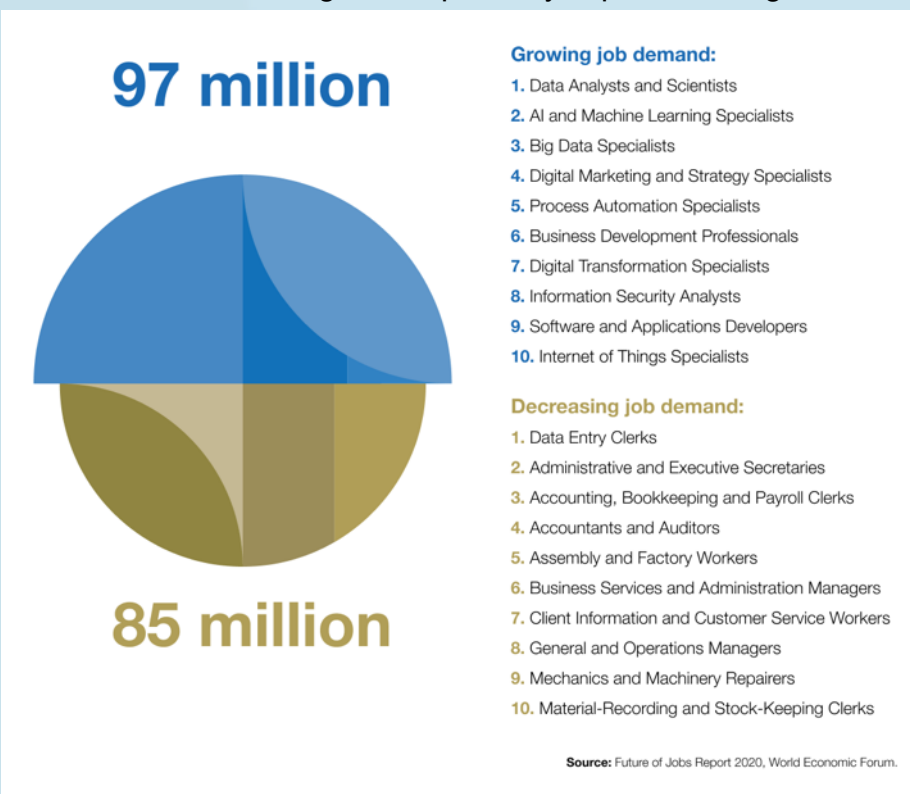
Enabling humans in a digital world

With 50% of the world needing reskilling by 2025,[54] the world requires a huge commitment to educational training and developing people with the skills needed for meaningful employment of the future. The job landscape by 2025 is tipped to see a displacement of jobs and a shift in the division of labour between humans and machines. This is identified as having considerable impact on existing roles and resulting in a 'growing job demand' sector and a 'decreasing job demand' sector as identified above.[55]

> *If disruption, uncertainty and growing inequality is to be avoided, and if opportunities in the digital, technological and green arenas in particular are to be grasped, then the imperative for reskilling those*
>
> *already in the workforce, and providing the skills necessary for new arrivals to thrive, is one of the most urgent matters facing governments and business.[56]*

With advancing into the digital, data and AI space, employers will in addition to filling emerging 'roles', be focused on building their human enablers. These will be employees who have design and technical skills and who are flexible, adaptable, and

able to learn. As human capacity is deployed more for designing, auditing, and innovating processes (as opposed to operating them), the need for people with design and technical skills will soar. Building career pathways upon teaching broader

97 million

85 million

Growing job demand:
1. Data Analysts and Scientists
2. AI and Machine Learning Specialists
3. Big Data Specialists
4. Digital Marketing and Strategy Specialists
5. Process Automation Specialists
6. Business Development Professionals
7. Digital Transformation Specialists
8. Information Security Analysts
9. Software and Applications Developers
10. Internet of Things Specialists

Decreasing job demand:
1. Data Entry Clerks
2. Administrative and Executive Secretaries
3. Accounting, Bookkeeping and Payroll Clerks
4. Accountants and Auditors
5. Assembly and Factory Workers
6. Business Services and Administration Managers
7. Client Information and Customer Service Workers
8. General and Operations Managers
9. Mechanics and Machinery Repairers
10. Material-Recording and Stock-Keeping Clerks

Source: Future of Jobs Report 2020, World Economic Forum.

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[54] World Economic Forum, 2022.
https://www.weforum.org/agenda/2020/10/top-10-work-skills-of-tomorrow-how-long-it-takes-to-learn-them/
[55] World Economic Forum, 2022
https://www.weforum.org/agenda/2020/10/dont-fear-ai-it-will-lead-to-long-term-job-growth/

[56] PWC, The World Economic Summit, 2022. The Future of Work and Education.
https://www.pwc.com/m1/en/world-government-summit/documents/wgs-future-of-work-and-education.pdf

soft skills at all levels will be critical where many of the traditional labour focused occupations are removed through automation.

The importance of collaboration and creative and critical thinking is paramount. These companies also require a very different organization model than the traditional management pyramid. Layers of approval are replaced by small, autonomous teams that are built and empowered to make decisions quickly. They are supported by platforms designed for scale so that everyone has access to the same data, technology, and resources.[57]

Enabling in this context is underpinned by access. Access to the technology needed to support new ways of learning, and accessing the infrastructure that enables that technology. Climate change response will be a critical enabler that will necessitate shifting a focus to ensuring whanau have access to strong digital infrastructure in ensure inclusivity and access to these educational tools, in addition to them being fit for Waikato-Tainui learners. This connection between access to digital tools and access to education was brought to the fore during COVID. This increased connection poses a real risk to equity in education.

Advancing Waikato-Tainui centric curriculum

Methods of learning will become more immersive and engaging through technology. These new ways of learning and engaging will continue to influence students and Kaiako. Along with this will come the need to identify tikanga and develop ways to ensure leadership in this space and hold space to ensure no erosion of cultural capital occurs through development in isolation without involvement of iwi. It is of utmost importance that learning opportunities and teaching tools are developed at pace to enhance and include te reo, tikanga and histories as lead by Maaori, and by Waikato-Tainui. It is critical that these components of curriculum evolve into this digital and technological space, alongside all other evolving curriculum. There is a real risk that if Maaori focused curriculum does not keep up, that the learning that has been championed by many over the last few decades, will fall behind. With Waikato-Tainui being committed to instilling te reo into homes of at least 80% of their tribal members by 2050,[58] an opportunity exists to utilise advancing technology to help deliver on this objective.

[57] https://www.bcg.com/capabilities/digital-technology-data/bionic-company
[58] Morgan, J et al. Te Mātārere O Te Reo: A Foresight Report on the Future State of Te Reo Māori in the Waikato-Tainui Rohe to 2038. Te Kotahi Research Institute 2022. https://kaupapamaori.com/wp-content/uploads/2022/03/Te-Matarere-O-Te-Reo-Booklet-Web.pdf

APPLYING THE INSIGHTS

To support the use of the above insights, these key trends need to be considered as themes and influences alongside the forthcoming decision-making criteria. The design principles for the decision-making criteria will be established, alongside a framework for prioritising projects within the planning and budgeting process in the next phase of this review.

When projects are being considered for inclusion in strategic planning and resulting work programmes, they must be considered alongside these other iwi based criteria. Prioritising works based on both the aspirations and vision set for the people, the needs of the people, and to prepare them for their possible futures. Using these trends to inform the future needs of the people, and therefore the future demands on the organisation, is its primary focus and purpose.

The prioritization of trends and responses to them are based on commitments to people, environment and culture. The areas that are most important may look different to others and therefore the rationale and decision making criteria will too.

Although the primary strategic programme development is not yet due for completion, some initial indication of changes in investment areas have been requested. These can be considered at a high level, in comparison to the current allocation of tribal resources.

The greatest national and local trends and influences will impact the next 5 years planning.

The current spend is reflected below. When considering the identified futures, some areas of current/previous investment may not reflect where the needs are indicated to be into the future. For example, the taiao spend is not in alignment with the needs and pressures that kaitiaki will face as an iwi organisation and as a people.

Some of the other areas of investment may not in the surface change in magnitude, but the kaupapa that sits within them may. Also OPEX costs which are in the greater part, staffing costs, may not be impacted, but the allocation of staff within the operational model may change and move where the increased Grants/Distribution/Projects movement occurs. This also aligns with the current organisational review that is under way. The fluidity of the recommendations from this Insights report and the greater 5-year review will focus on kaupapa and projects, as opposed to who will undertake them, given the movement that may occur as a result of the organisational review.

FY2022 APPROVED BUDGET AND TOHU

To enable an analysis of the budget as well as to support consideration of a comparative allocation for future budgets, the FY2022 budgets and actuals have been considered and detailed below as percentage of overall spend.

- Whai Rawa – 19.4%
- Hapori – 23.7%
- Mahi Tonu – 21.7%
- Taiao – 9.5%
- Kaupapa 25.7%

Whai Rawa 19.4%
Hapori 23.7%
Mahi Tonu 21.7%
Taiao 9.5%
Kaupapa 25.7%
FY2022 Budget
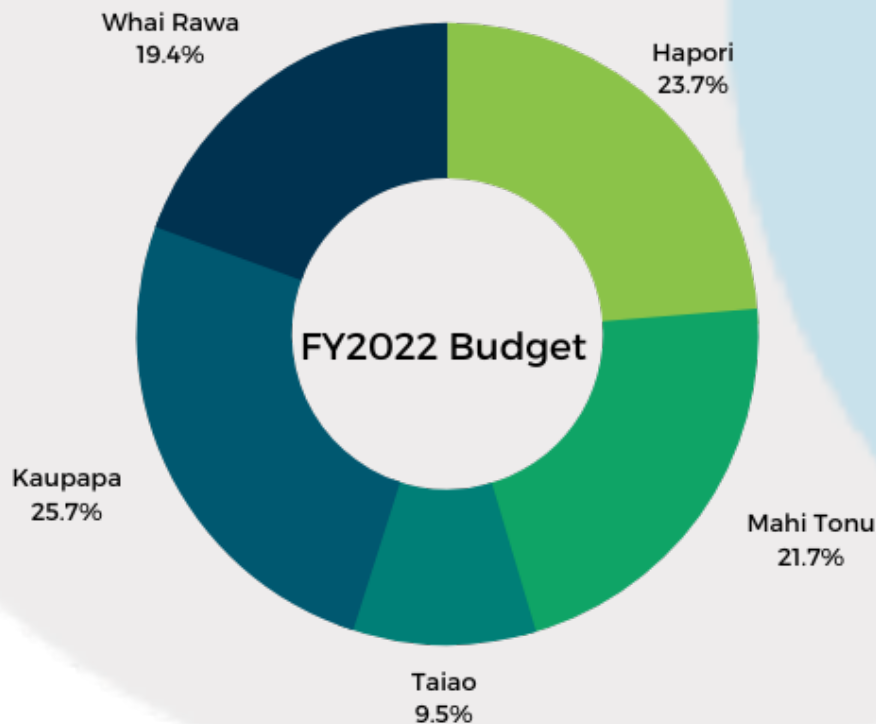
External Funding

Of note, there appears to be limited accountability and financial reporting available (albeit board reports report on the work itself being undertaken) in relation to externally funded projects delivered with Waikato-Tainui.

> *Recommendation*
>
> *A recommendation would be that any external funding is included within proposed budgets, to better leverage this putea, and align work programmes and outcomes that could likely result in multiple wins for the organisation. This will also help highlight areas of risk where funding is relied upon for staff and resourcing, so that if there is a shift or retraction in government spending, the organisation can quickly understand the likely impact this will have on tribal employees and*

A FUTURES BUDGET

The aim of this 5-year plan is to support a transition away from what has become business as usual. With the organisational review taking place contemporaneously, the focus for this 5-year review should be on identifying what work programmes will need to increase or develop to enable Waikato-Tainui to be a responsive and innovative iwi, that is less impacted by the headwinds in the upcoming future.

Although at this point it is too early to consider defining a budget in detail as a result of the work being undertaken, Whetū are able to consider how the above trends might influence each work programme within the outcomes framework and in turn how this might impact budgets and allocation of resource.

Without identifying specific projects that are to be assigned against each area of outcome, Whetū can see where there needs to be an obvious increase or realignment of spend to ensure preparedness for the futures ahead.

TAIAO – MOST SIGNIFICANT INCREASE

The changes based on the insights and trends will be most significantly in the Taiao space. There will need to be a significant spend on developing programmes in preparedness for the 'Responding to a Changing Climate', 'Governing Te Taiao'. Further, the application of both data and AI in better understanding the environment and the issues it faces, alongside innovating solutions, should be a critical pathway to pursue.

- Digital environmental solutions
- Transforming governance through technology
- Increased role in governance through resource management
- Increased role for projects as active kaitiaki within te taiao and particularly for the awa

Existing work programmes continuing and with new project foci influenced by trends there will need to be a large increase in budget previously allocated for TAIAO.

TAIAO grants and distributions including new Project Foci:

- 'Responding to a Changing Climate'
- 'Governing te taiao'
- 'Increasing automation and autonomy with AI'
- 'Rapid growth of data and digital economies'

HAPORI – INCREASE

'Changing face of Education' and 'Prioritising wellbeing' will underpin a transition within Hapori. Working to support rangatahi and job seekers towards better learning outcomes that are suited to the changing futures Aotearoa New Zealand face, will be key. Increasing acknowledgement of the role that wellbeing plays as the population ages, will see tikanga and reo only increasing in importance. A movement of this the 'Tikanga Ora Reo Ora – Maatauranga' from the Kaupapa work stream, will support better aligned of this objective.

- Deliberate strategy to engage tribal members in digital and technology career pathways
- Focus on cultural wellbeing as both integral for the iwi and whanau, as well as an opportunity for employment pathways
- Lead innovation and control of digitising tikanga, reo and maatauranga

Existing work programmes continuing and with new project foci influenced by trends there will need to be an increase in budget previously allocated for HAPORI.

HAPORI grants and distributions including new Project Foci:

- Community assistance
- Kaumaatua assistance
  - Kaumaatua travel
  - Tertiary education
- Tikanga Ora Reo Ora – Maatauranga (moved from Kaupapa)
- 'Changing face of Education'
  - 'Prioritising wellbeing'
- 'Increasing automation and autonomy with AI'
- 'Rapid growth of data and digital economies'

KAUPAPA AND WHAI RAWA – REDUCTION

Merging of these outcomes to consolidate collective strength and marae based kaupapa and movement of Reo and Maatauranga kaupapa into Hapori.

'Responding to a Changing Climate', 'Increasing automation and autonomy with AI' and 'Rapid growth of data and digital economies' will all work to transform asset management and ensure thriving marae and collective strength. Working with more and more data to help protect and preserve infrastructure and cultural capital will become optimized and more effective through innovative solutions and technologies. These will feed and tailor climate change response and adaptation planning.

- Digital asset management solutions optimising operations
- Innovative and data lead responses to protecting marae most at risk
- Focus on climate adaptation for marae and tangata based on more available data – focus on marae spend on self-sufficient practices such as mara kai, energy production, circular principles and opportunities
- Focus these principles towards transforming all kaupapa driven events, and maintenance programmes

Existing work programmes continuing but merged for synergies and gains across tohu. The and with new project foci influenced by trends there will need to be a decrease in budget previously allocated between both KAUPAPA and WHAI RAWA.

KAUPAPA AND WHAI RAWA grants and distributions including new Project Foci

- Marae insurance
- Marae facilities
- Maatauranga Grant
  - Koroneihana
  - Poukai
- Waka Taua maintenance
  - Taurahere
- Taupiri Maunga
- Ngaa Marae Toopuu
  - Regatta
  - Brass Band
  - Marae dividend
- 'Responding to Changing Climate'
- 'Increasing automation and autonomy with AI'
- 'Rapid growth of data digital economies'

MAHI TONU – SOME REDUCTION

'Increasing automation and autonomy with AI' and 'Rapid growth of data and digital economies' should and will influence organisational operations to ensure it is able to pursue the collective major/prioritised outcomes, particularly where working to streamline efficiencies and be accountable to tribal members, and with resources. Remaining abreast of 'Economic influences' will underpin all decision making to ensure the iwi remain ahead of or able to adapt to economic shocks or impacts at all times. These things will contribute to maintaining a high performing organisation making an impact.

- Define and then lead approaches to data sovereignty
- Completion of organisational review
- Organisation wide adoption of digital infrastructure to support streamlining of operations

Existing work programmes continuing but reduction in budget required due to temporary College. The tohu wide work programmes that will increase efficiencies will also support this decrease in budget required.

MAHI TONU grants including new Project Foci:

- Service Level Agreement - KGSL
- * Deed of funding – College
- 'Increasing automation and autonomy with AI'
- 'Rapid growth of digital and data economies'

'Economic Influences' – embedded throughout planning'

POTENTIAL BUDGET IMPLICATIONS

A summary and overview of budget implications for each tohu was provided to the General Manager, Maatauranga / Education & Pathways, to support budget discussions and has since be revised and included below. An overall recommended budget resulting from these recommendations is reflected in the doughnut below, representing what percentage of the overall budget might be allocated to each tohu, based on the trends detailed in this report.

POTENTIAL BUDGET IMPLICATIONS (NEXT 5 YEARS)

TAIAO

The changes based on the insights and trends will be most significant in the **TAIAO** programme.

Statutory changes in resource management have vastly increased expectations on iwi and hapuu involvement. This level of participation will require significant increase in resourcing.

Investment is fore-shadowed in programmes for 'Responding to a Changing Climate' and 'Governing Te Taiao', and transformations to digital and AI platforms.

- Digital environmental solutions
- Transforming governance through technology
- Increased role in governance through resource management
- Increased role for projects as active kaitiaki within te taiao and particularly for the awa

HAPORI

'Changing face of Education' and 'Prioritising wellbeing' will underpin a transition within **HAPORI**.

Working to support our rangatahi and job seekers towards better learning outcomes that are suited to the changing futures Aotearoa New Zealand face, will be key. Increasing acknowledgement of the role that our wellbeing plays as our population ages, will see Kaupapa Maaori approaches, tikanga and reo Maaori only increasing in importance. A movement of 'Tikanga Ora Reo Ora – Maatauranga' from a **KAUPAPA** workstream and into **HAPORI** is viewed as a better alignment of this objective.

- Deliberate strategy to engage tribal members in digital and technology career pathways
- Focus on cultural wellbeing as both integral for Waikato-Tainui, as well as an opportunity for employment pathways

TAIAO

SIGNIFICANT INCREASE

HAPORI

INCREASE

- Lead innovation and control of digitalising tikanga, reo and maatauranga

MAHI TONU

'Increasing automation and autonomy with AI' and 'Rapid growth of data and digital economies' should and will influence all organisational operations to ensure ability to pursue collective outcomes, particularly where efforts to streamline efficiencies and be accountable for iwi resources. Remaining abreast of 'Economic influences' will underpin all decision making to ensure activities remain ahead of, or able to adapt to, economic shocks or impacts at all times. These things will contribute to maintaining a high performing organisation making an impact. Aside from inflation related increases, the organisational changes to the College operations will result in savings.

- Define and then lead approaches to data sovereignty
- Implementation of organisational review outcomes
- Ongoing investment in digital infrastructure to support streamlining of operations

KAUPAPA - WHAI RAWA

Merging of these outcomes to consolidate collective strength and marae based kaupapa. 'Responding to a Changing Climate', 'Increasing automation and autonomy with AI' and 'Rapid growth of data and digital economies' will all work to transform our physical and cultural asset management and ensure thriving marae and collective strength. Working with more and more data to help protect and preserve our infrastructure and our cultural capital will become optimized and more effective through innovative solutions and technologies. These changes will feed into and tailor our climate change response and adaptation planning and will result in efficiencies across the board.

- Digital and cultural asset management solutions & optimisation of operations towards transforming all kaupapa driven events, and maintenance programmes
- Innovative and data lead responses to protecting our marae most at risk
- Focus on climate adaptation for marae and tangata based on more available data – focus marae spend on self-sufficient practices such as mara kai, energy production and circular principle

A FUTURE BUDGET

At a high level, any futures budget will need to include the following changes in response to the indicated trends and how they will impact Waikato-Tainui whaanau, marae, organisation and taiao:

The 2022 year spend on both Grants and Tohu budgets is consolidated within each Tohu in the doughnuts below. This has then been adjusted to include proposed changes above and represents an average year with the futures Five Year Plan. It is also recommended that an increase to the overall budget is included to account for inflation but that these figures are established at standard rates per year after budget levels have been established. The focus of transitioning work programmes to this budget, will take place within the next phase of the review.
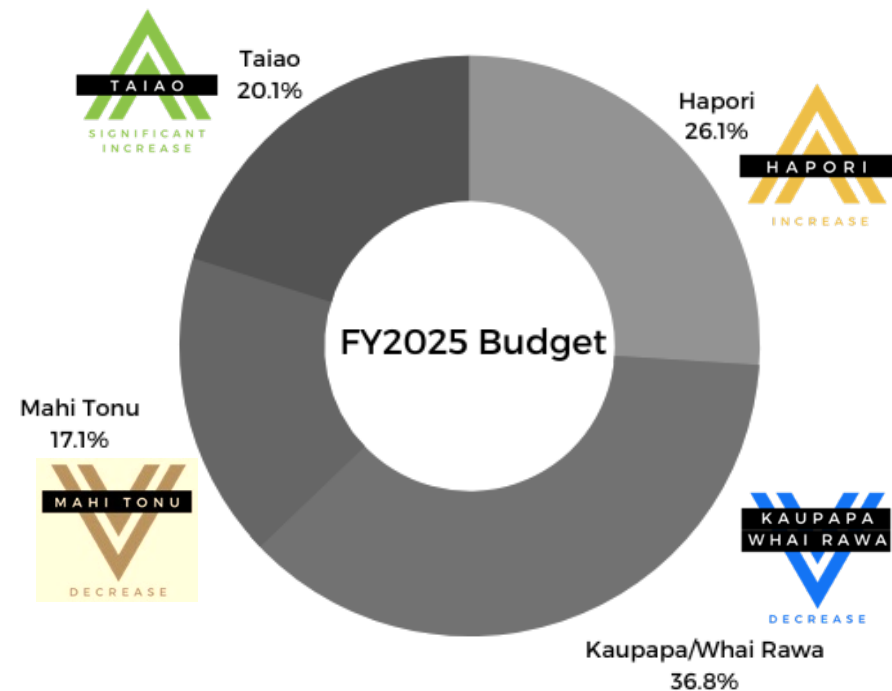
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AND

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Te Pae Anamata

Rapidly growing data and digital economies

Moving at pace and impacting people through dependancies, transparency and access to information

Up to 85% of jobs that will exist in 2030 haven't been invented yet

How do we ensure we are prepared to be part of this new economy?

Increasingly autonomous with AI

Rising artificial intelligence and autonomous systems increase productivity and outputs across every industry

Technology and innovation will drive prosperity

Having reliable connectivity for our whaanau and marae will ensure they aren't left behind

Our comparitively young tribal population makes us ready for these oppotunities

Changing face of education

Online, accessible, mirco/ short courses to align with the changing workforce and markets.

Maintaining mana motuhake

What is our role in this?

Our current education systems are failing our rangatahi.

This is an opportunity to lead system change and create an environment where our rangatahi thrive and are prepared for the future.

Maintaining mana motuhake

Loading innovation in data sovereignty

Koiora

Activate

Te Aka Whai ora
Māori Health Authority

Fluent in
te reo
Well educated

Prioritising Wellbeing

A greater desire to pursue wellbeing, in the face of an aging global demographic, emerging diseases and unhealthy lifestyles

Tribal identity and integrity Committed to Kiingitanga

hā ki roto

Negative health impacts will be greater for people that already experience disadvantage and poorer health

Strong in tikanga

How will our future look?

We will strengthen our connection, our tikanga, our reo, in the face of these challenges
Maintaining mana motuhake

Governance and Management of Te Taiao; Global Economic Influences and Changing face of Education