MUKA TANGATA
People, Food and Fibre
Workforce Development Council

FUTURE OF THE FOOD AND FIBRE WORKFORCE

June 2022
FutureCentre.nz for Muka Tangata

FUTURE OF THE FOOD AND FIBRE WORKFORCE

What might we discover by thinking about alternate futures for the Food and Fibre Sector In Aotearoa New Zealand that might inform Workforce Development?

MUKA TANGATA
People, Food and Fibre
Workforce Development Council

June 2022
FutureCentre.nz for Muka Tangata

Kōrero Whakamua

Foreword from Jeremy Baker

Jeremy Baker, Chief Executive

Muka Tangata – People, Food and Fibre
Workforce Development Council
Aotearoa New Zealand

Muka Tangata commissioned the Food and Fibre Futures project and this report to help our sector and industries gain a stronger understanding of their future skill and workforce needs.

This project was aimed at providing an opportunity for our sector – employers and industry leaders, hapū and iwi Māori, workers and learners, to consider the longer-term and 'big picture' issues facing our sector, and the implications of these issues for skill and workforce needs. We wanted to ensure that we covered both long and short-term skill and workforce challenges and opportunities.

As technology develops, and environmental challenges grow – we know that has an impact on workforce needs. But we also know that whatever challenges come our way – we will need skills and training to turn them into opportunities.

This report will guide us in discussions as we develop workforce development plan for each industry. These plans will determine which qualifications, standards and micro-credentials we will develop, and guide us in working with vocational education organisations on delivery to meet workforce needs and aspirations in the Food and Fibre Sector.

We look forward to using this report as we work alongside our sector to help them, and education providers, design solutions that we can advise the Tertiary Education Commission to fund.

Contents

Project Overview and Summary

Objectives

The objective of this report is to start a conversation with the Food and Fibre Sector about the Future of Work and Workforce. Out of that conversation, we aimed to identify potential futures to inform the needs of, and skills and training required for that sector. We consider the final product a thinkpiece on the future of the Food and Fibre Sector in Aotearoa New Zealand. It further acts as an input into the Strategy development for Muka Tangata, the Food and Fibre Workforce Development Council.

We set out to

1. Review other Workforce Development Programmes in the Food and Fibre Sector
2. Identify Drivers of Change that are affecting the Future of Food and Fibre for Aotearoa New Zealand
3. Build community engagement with Muka Tangata and engage in a conversation about the future of the Food and Fibre Sector
4. Identify alternate futures (scenario planning) which may play out within the Food and Fibre Sector.

Methodology

Muka Tangata engaged FutureCentre.nz, a Wellington-based Futures consultancy, to explore the future of the Food and Fibre Sector with an eye to stimulating discussion about those futures.

Our work was completed in four phases. The first three were a literature review, interviews with industry leaders, and a series of workshops with approximately 300 total participants from the Food and Fibre Sector respectively. Over 100 of those participants also joined us for a review of our findings and provided input into the draft report. The interviews and workshops were used to identify the Drivers of Change affecting the future of the sector as well as to flesh out scenarios for four potential alternate futures.

This report and its findings are a summary of a national conversation led by FutureCentre.nz. It does not represent policy, or the views of Muka Tangata or FutureCentre.nz

Drivers of Change

The following Drivers of Change were identified as changing the future of the Food and Fibre Sector in Aotearoa/New Zealand

1. Tino Rangatiratanga and Mana Motuhake
2. Demographic changes
3. Going Green
4. Going Digital
5. Value Over Volume
6. The Gig Economy

Four Futures

Puna ki te Puna - Tipuna ki Mokopuna

Yeah, Nah

Nāu te rourou, nāku te rourou, ka ora ai te iwi

Slice of Heaven

Four Futures

We created four speculative futures and respective strategic responses informed by our discussions, reading, and community workshops.

We aimed to work with the community to create a thinkpiece about how the future might unfold, not to achieve a consensus on a single "preferred future". The future that actually unfolds is likely to have elements from all four futures in it.

The high level characteristics of these four community-created futures are:

Puna ki te Puna - *Tipuna ki Mokopuna*

An increase in Māori ownership in land and sea-based industries (particularly post-settlement) and an increase in Māori workforce across the sector (both in number and proportion); Māori employers investing in their people, with a particular desire to increase access to greater wealth for their families through higher skills and opportunities workforce; a return to ancestor knowledge systems for the production of kai (mātauranga in action); stable employment (often close to home marae); higher environmental regulation and protection than is the status quo; a strong drive towards premium pricing for the products and services being produced; a continued steady rollout of new technology, with access to technology being constrained by ongoing issues such as access to basics (cellphone coverage, broadband) continuing to be less in Rural communities, particularly those with large Māori populations, and assuming a continuation of inequities of access and the digital divide.

Yeah, Nah

An increase in foreign ownership of the primary sector, fishing quotas, forests etc; an increase in new migrant workforce largely originating in India and China (including climate refugees from the Pacific and Asia); growth of the Gig Economy where people have multiple jobs (either concurrently, or over the year), and casual employees, or self-employed contractors; less speed in increasing environmental regulation (possibly deferring entry in ETS, delaying water and other regulation for the Food and Fibre Sector); good productivity gains meaning increased volume of production and increased revenue for producers; steady but not transformational access to technology that assists increase in productivity. Employees are responsible for their own training as the workforce becomes more fragmented.

Nāu te rourou, nāku te rourou, ka ora ai te iwi

We see an extension of the status quo, where there are players operating different strategies

increasing both premium and commodity production; environmental protection and regulations increase; companies go over and above those regulations and standards in order to achieve premium pricing from niche offshore markets; increased regulation also leads to increased innovation and use of technology at all levels of production; climate refugees are integrated into our rural and regional economies and they appreciate being welcomed into a bicultural nation, and equally find their cultural needs and practices are supported in their new communities; some work is done by offshore (sometimes seasonal and/or casual) workers who operate and monitor equipment remotely.

Slice of Heaven

An increase in made up of Māori (particularly post-settlement) family business and socially and environmentally responsible locally-owned corporate ownership in land- and sea-based industries, combined with and an increase in Māori workforce across the sector (both in numbers and in proportion); supplemented by offshore workers who live offshore and use high technology in order to operate remotely (eg drones, remote monitoring of quality and compliance; increase in autonomous vehicles/farm equipment operation, robotics for horticultural processes, including pollination, pruning and picking); high environmental regulation leading to innovation in climate-friendly production; higher adoption of this technology leads to higher productivity for commodity producers (eg forestry, dairy); employers co-operating in order to keep workers employed throughout the year in their rohe and towns; employers provide training in order to ensure their capital intensive equipment is managed well and optimally used; locally sourced capital reinvested into growing profitability; Māori and other employers invest in their people, with a particular desire to increase access to greater wealth for their families through higher skills and opportunities.

Insights for Workforce Development

Each scenario has slightly different needs and suggestions for strategic responses from Muka Tangata. Even so, there were a number of common themes.

People are looking for broader skills beyond just “how to do the job” – though they want those too. Cultural competency and identity, Te Reo and Tikanga along with leading and working in multicultural teams came through as specific needs. Bridging the digital divide, and providing opportunities for social, online learning backed up with in-person (and sometimes residential) training was desired. Employers were looking for governance, leadership, pastoral care and interpersonal skills training. Opportunities for people to learn literacy and numeracy, and for neurodiverse learners to feel included were stressed. Deep science and technical skills will be needed in the future; there was concern about balancing the need for micro-credentialling with longer-term University qualifications. A volatile world requires people with flexibility. At the same time, training should help them to be socially mobile and better providers for themselves and their whānau. Finally, learning was seen as an intergenerational and lifelong pursuit.

More specifics may be found in Section 5 of this report.

SECTION 1:

Background and Context

Background

Muka Tangata commissioned FutureCentre.nz to prepare a thinkpiece into the Future of Work for the Food and Fibre Sector in Aotearoa New Zealand that could feed into its strategic thinking.

Muka Tangata

Muka Tangata are one of six Workforce Development Councils (WDCs) established to provide industry and sector voice and advocacy within the vocational education system of Aotearoa New Zealand.

Muka Tangata exists to ensure that the Food and Fibre Sector, industries, and whānau, hapū and iwi Māori get the skills and workforce development they need. Muka Tangata works on behalf of the whole Food and Fibre Sector within the vocational education system. Specifically, we work for agriculture, livestock, arable, horticulture, wine, forestry, seafood, equine and racing, veterinary and support services.

Specifically, Muka Tangata:

- Identifies Food and Fibre Sector, industry, and hapū and iwi Māori skill and workforce needs, and documents these in workforce development plans.
- Develops qualifications, standards and micro-credentials to meet those needs.
- Works with providers – including Te Pūkenga, Wananga and PTEs – to develop and endorse programmes that deliver those qualifications, standards and micro-credentials.
- Advises the Tertiary Education Commission on what funding to invest to deliver those programmes.
- Supports providers to deliver high quality programmes and courses using Muka Tangata quality assurance and moderation tools.
- Works with the Food and Fibre Sector, industries, and iwi and hapū Māori organisations to ensure their skill and workforce needs are met, including advocating for changes in policy.

Muka Tangata within vocational education

Muka Tangata has taken over the qualifications, standards-setting and quality assurance roles of the Primary Industry Training Organisation (ITO) and Competenz (for forestry). Both the Primary ITO and Competenz will be part of the Te Pūkenga, the organisation bringing together campus and work-based public vocational education across Aotearoa New Zealand.

Muka Tangata works with Te Pūkenga, Wānanga, numerous private training establishments (PTEs), and universities to improve the relevance, range and quality of vocational education for the Food and Fibre Sector.

Muka Tangata also works closely with the 15 Regional Skills Leadership Groups (RSLGs) that have been established to provide advice on regional labour market needs. The Food and Fibre Centre of Vocational Excellence (CoVE) is another key partner, focused on developing excellence in food and fibre vocational educational delivery.

In developing this report, we worked with Muka Tangata to involve RSLGs, the CoVE, numerous PTEs and other training entities, the ITO, government agencies, industry associations, unions, and companies across the sector, Iwi and other Māori entities as well as individuals from the sector.

Important contextual questions we were asked to consider include:

- What changes do we expect to see in the sector in the next period?
- What might we expect to stay the same?
- How might we identify the Drivers of Change that might inform our strategy?
- How might Drivers of Change/ Megatrends help us to think about alternate futures and to prepare for them?

There have been many other reports produced on the Future of Work, but none have so far focussed on the Food and Fibre Sector. Others, further, have assumed urban work as their starting point.

We are also aware that NZIER is working with MPI to estimate future workforce needs in the Food and Fibre Sector. That work is part of MPI's Primary Sector Workforce Programme and is developing estimates of labour requirements for different industries, types of roles and regions. The NZIER work also considers the impact of changes in technology and world markets on workforce needs. The aim is to produce a publicly-accessible and detailed dataset describing the future workforce in the sector. Our project does not attempt to answer those questions.

SECTION 2:

Our Methodology

FutureCentre.nz undertook this project in five phases

The first was to undertake a literature review with regards to how other Food and Fibre Workforce Development Councils (and similar organisations) globally are thinking about and solving similar problems to Muka Tangata.

This report was delivered to Muka Tangata separately in March 2022 and included a particular emphasis on identifying any workforce development planning undertaken in partnership with Indigenous peoples.

The **second** phase involved 24 in-depth interviews with industry leaders. These included a range of people from across the Food and Fibre Sector and the Muka Tangata Council. A particular effort was made to include Indigenous voices. Key findings from those interviews were used to help to shape the next phase, and to establish an initial list of Drivers of Change which are shaping the sector in the future. Detailed insights from those interviews were presented to Muka Tangata in April 2022.

The **third** phase was the development of the Drivers of Change, and testing these through interviews, workshops and supplementary research.

The **fourth** phase was a series of fifteen workshops hosted by Muka Tangata, involving 300 participants, which took place from Kerikeri to Gore, and Hokitika to Tairāwhiti/Gisborne. The Blenheim workshop was held online using Mural given the spread of Covid-19 within the community. An Ākonga/Rangatahi workshop was designed specifically to gain more insight from young people and learners and was also run online. We also ran a feedback session online, attended by 100 people via Zoom.

The **fifth** phase was the creation of four Plausible Futures which inform strategic insights into workforce development for the Food and Fibre Sector. The creation of multiple futures rather than a single preferred future allows for the development of a more flexible and resilient response. We also identified possible strategic responses to those futures for Muka Tangata.

SECTION 3:

Phase One

Literature Review

We were asked to review international reports on workforce development within the Food and Fibre Sector with a particular emphasis on skills development from an Indigenous or bicultural point of view.

Key Findings from our global Literature Review were

1. No other country reviewed considers “food and fibre” - including agriculture, livestock, arable, horticulture, wine, forestry, seafood, equine and racing, veterinary and support services - to be a single sector. We, however, consider a “Hops to Seafood” approach, with every land-based industry in between. Interestingly, a number of Māori entities commented to us that they are heavily invested across a variety of land-based products (e.g. hops, viticulture, silviculture, aquaculture and fish processing) and that the wide grouping made sense to them. Other entities were more likely to be invested in a single sector - such as Dairy, Meat, Arable farming, or Equine
2. No other country reviewed took a broad view of Indigenous needs in skills development for the Food and Fibre Sector
3. There was consistent consideration for the need to change perceptions to attract a larger, high-quality talent pool with the right skills needed in the sector (including pre-career marketing of food and fibre careers to school-aged people)
4. There was a strong emphasis on national qualifications and standardised approaches to learning/training

5. Active partnerships between government, farmers and rural communities only help support clear pathways into Food and Fibre jobs for both local and international workers
6. A cross-cultural focus on creating workplace conditions that attract and retain highly-skilled workers, particularly as there is an increase in ethnic and gender diversity in the workforce.

Indigenous Approaches

We also looked for specific reports internationally that took an Indigenous lens or considered a need for a bicultural approach. There were not many of these, and they were generally quite specific to locations or production types.

In summary, we found they suggested:

1. Government and Indigenous groups should work together to consider new models of schooling that better suit indigenous needs and promote growth. They found that many traditional programmes had not served a multiplicity of learning styles, or co-operative and practice-based learning
2. Greater educational participation and performance by Indigenous people will create a more skilled and successful workforce and increase the number of positions and opportunities available improving economic outcomes for those communities
3. Change is required in the introduction and maintenance of culturally responsive and safe recruitment, selection, induction, and orientation in workplaces
4. The promotion and strengthening of Indigenous public and community sectors' careers
5. The need for specific employment and career pathways designed to increase skill bases for Indigenous people and employees, including targeted, appropriate skills development and training
6. The need for all employers to invest in and develop skills in cultural competence for their leaders and other staff.

The willingness of an organisation to invest financially in the training and education of its Indigenous employees is just one way to demonstrate a commitment to the development of Indigenous Employees

SECTION 4:

Phase Two

Interviews

We identified 24 sector leaders or Rangatira and interviewed them using open-ended questions. The interviews were held between January and March 2022, for 45 – 60 minutes each. Most were conducted by phone, though a few were in person.

We were looking for insight into the future of the sector and its workforce. The list of people interviewed may be found in Appendix 1.

The questions we asked were:

1. What do you see as the key opportunities for the sector over the next 10 years?
2. If these are achieved, what do you see that will make them possible?
3. What do you see are the key risks and challenges that will need to be dealt with along the way? What do you think would be the best way to manage these?
4. What do you think the ideal workforce for this future looks like? How do you think they could best be trained and developed so that they are empowered?
5. What would it take for workplaces to attract and develop people who thrive in the sector? How can we use workforce development to raise opportunities for our communities and give people better lives?
6. Is there anything else you would like to add?

The breadth of the questions allowed the interviewee to extemporise and added richness and depth to the material that was contributed.

We used the interviews to frame up an initial list of Drivers of Change, which were further developed through the workshop process. We also fed the key insights from the interviews into the workshops and tested whether they resonated with participants.

Key Themes to come out of the interviews

- The future of the Food and Fibre Sector is more Māori than at any other time in the last 100 years.

> **"From a Māori perspective the biggest opportunity is around Māori land and utilising Māori whenua in a way that supports the sector. There is a lot of underutilised land due mainly to lack of access to capital. Unless we can activate Māori land we will struggle to realise the opportunities in the sector e.g. diversifying plants; micro greens – any crop is possible – working with the right people to help identify the best crop/crop cycle for that environment. Also pressure on good land from urban development."**

- Wānanga (Aotearoa, Raukawa and Awanuiarangi) have a role to play in supporting non-Maori and migrant workers in teaching Te Reo Māori and cultural competency. This will support workers living and working in Māori communities or regional areas with high Māori populations.

> **"Whatarangi Winiata was an educationalist, a smart guy from an older generation. He wanted Māori to be the best educated people in the world. He recognised that Māori learn differently and have different knowledge and ways of exchanging information. It's spawned a whole lot of other Māori learning institutes and wānanga programmes. Now there are lots of clever Māori."**

- Desires to see young people advance their economic status through training - both as a way for employers to improve productivity and profitability, and rangatahi to gain social mobility and access to better wages and a better standard of living. Education and training should increase the opportunities and wealth creation for akonga/trainees/employees.

> **"Give the growers roles at supervisor or management level. Get them on a pathway to senior management, whether on orchard or crop. They need to see there is a pathway to higher earning and more responsibility. It's key for the young. Accept that they have skills that they learn a different way. They're digital natives so the teaching has to adapt e.g. using gamifying. We had a boy was onsite with a digger who learnt from playing PlayStation. Think broadly – those skills are transferrable."**

- Belief that increased regulation is inevitable and the workforce will need to be trained in greater levels of compliance and care. Alongside this is a feeling that increased compliance costs and care for nature and the environment will drive demand for increasing numbers of people with solid science and technical skills.

> **"People cry out for farm advisors who know how to deal with environment questions. We also have the forestry sector crying out for people who can do planting or harvesting and use new machinery that is safer and better. We need skills everywhere, but no one wants pay for that skill development. No one wants to pay to send an existing farm advisor off for a year's training and then come back and advise 100 farms on how to do an integrated farm plan.**
> **People learn enough to get by, self-teach, learn by doing, cobble something together and its good enough. But it could be better."**

- Belief that technology will accelerate, and there is excitement and fear about this, including a concern that there may not be the right governance in place in our Food and Fibre businesses for a technology-driven future. It was also suggested that an international workforce may be able to use technology to operate equipment remotely, including for horticulture

"The risk is that we can't attract the people we need. Five years ago we just needed someone who could handle a spade. Now they have to handle an iPad and data collection as well. The primary sector is still seen as unskilled manual labour. "

- People view the primary sector as underrated and underpaid;- it is a science-backed, often technical sector but is seen as 'manual labour' and thus not highly skilled.

"If we can move to a more knowledge-based food and fibre industry as our primary modus operandi, we won't have our current perception problem. i.e. people won't think of us as primary industry anymore. We will be as cool and sexy and interesting and important to a developing nation as any other industry. NZ has struggled because we are the only developed nation who relies as much as we do on the primary sector. If we can move to being world leading in terms of knowledge it will be an advantageous part of our economy.

Work in the agri sector looks very hard and I don't see how that can be attractive to anyone. It's outside, weather dependent, low paid, conditions are poor. You are very dependent on your immediate environment - if you have a bad boss life will be hell. If people live on a farm they have more at stake - if they leave, they lose their job and their home too so that is high risk and makes it unattractive"

- While there was a lot of support for just-in-time micro-credentials, there was concern that these may not provide the depth of knowledge needed to solve the wicked problems we are facing, including climate change-induced need to change farming systems, competition for labour, disease outbreaks etc. There was a need to balance deep science knowledge - including post-graduate research and qualifications alongside "just in time" skills development.

"The ideal workforce for the future is adaptive to change and has a core set of skills that can be applied to a range of contexts so that if we hit market shocks or variability – which we always have – our workforce doesn't become a casualty like a market or a product could. The ideal workforce is world-leading, aware of what is going on around the world, internationally connected, the best. We are able to sell that ability and knowledge and skill set through our innovations in products and services to the rest of the world."

- A preference for a stable workforce, but no sense that that will happen.
- Many businesses are looking to increase production and productivity through worker training and skills.
- Environmental pressures are increasing at the same time as awareness of the need to care for Papatūānuku is getting increased attention. Some businesses are seeking to raise prices by market-led qualities that may include increased environmental and animal welfare practices.
- There are economic and educational inequities for Māori that must be addressed

'"There's a beautiful story about Whakatōhea Mussels Ōpōtiki Ltd. They had marine farms set in the Ōpōtiki area for a while and established a new processing plant. There wasn't a large supply of labour. And the community has had employment issues. They knew they needed to work with the community. Before the factory (part iwi-owned) was even built they established a relationship with their local iwi' their training programs are

iwi-based. It was about having buy in and also allowed local community members to be a shareholder for small amounts of money. They worked closely with the local community to find out what they needed and provided that – all pre-employment. So, when they factory opened they had a supply of labour. The local community loves it. It's a good source of employment and labour. They provided a platform. They also provide lunch – because they know that is an issue for some of the staff. The company took the time to find out the need first, then actually met it. And did a brilliant job of the relationship building – they did a lot of planning and acting well before the factory opened. It's also about allowing the local community to lead things in whatever way works for them.

- Gender norms are changing, and more women are taking on a range of roles

"In forestry we need more women in our crews. We have had a few come through and it brings a culture change with them. It takes a bit to convince a woman she can do it, that she won't be looked down on and is capable. We are not tapping into that enough."

- There isn't consensus regarding whether employees should be required to arrive ready to work and fully trained, or if the employer should ensure employees are trained. Interestingly there were some generational differences here with older employers believing it was not their role to train people or pay for training, and that if employees want the job they should be prepared to pay for training to get or keep it. Māori entities were more likely to express a desire to invest in employee training and development

"We need a good employee value proposition: 'why would someone want to work for us and how does that fit in or with their life and their community and how is the business part of their community?

Businesses don't want to invest because the worker will go somewhere else for another dollar an hour. I will lose that person. We are in a low wage/low investment 'equilibrium' in economic speak, because of decisions made in 80's and 90's. The government should do it for free"

- Online and at-work training were supported along with the need for learning to be social, and in groups of people learning together. There was a preference for cohort training - where people learn online together, in groups, in the same timeframe (eg 6-week courses, rather than individuals starting courses and completing them alone on-demand.) Most people saw vocational learning as a hybrid pursuit, combining online learning with opportunities for off-farm/off-ship/off-orchard/out-of-the-forest face-to-face events and residential training. To train and develop them is an' earn-while-you-learn' scenario.

"They won't come to a classroom but will turn up to work. Using down time in the orchard to learn forklift and truck driving. You can wrap a learning program around what they are doing on a daily basis"

- There was a desire to see Mātauranga Māori accepted by the mainstream, but not appropriated or commodified.

"Mātauranga says we are not the masters of this place. The masters of our world are our environment, our waterways, our weather, our climate. Mankind seems to think we are master, and they will do what we want. We are not master. Our job is to include those environmental atua, those gods into our considerations every time. They are the boss, not us.

Learning mātauranga Māori – How do we bring those helpful practices to a modern context to minimise impact on waterways and additives like fertilisers and pesticides? They didn't have cool stores, they'd dig deep holes for potatoes and put ferns on top which helped preserve the kumara or potato. How do we bring ancestor knowledge into today's world, without appropriating it, or just sampling pieces of it?"

Not just for Employees

Throughout the interviews, employers expressed concern that the sector has focused exclusively on employees needing training in the past. Employers consistently asked for skills development and training support. These sentiments were echoed in the workshops. In particular, employers expressed a lack of confidence with regards to

- Managing change and conflict

"People leadership training is needed - employers need to learn better ways of dealing with people. They need soft skills re communication, dealing with conflict, working in teams – and it needs to start earlier. How can you force it? We need accreditation or something like that. "

- Leading organisations/providing leadership to employees.

"Workplaces and managers /supervisors / leaders need the skills and confidence to attract and retain people. If you don't know how to motivate, coach, engage, manage, support someone, you are not going to be able to attract and retain. So as people go through our education systems we need to make sure they have those basic skills.

Empowerment comes down to the employer and their ability to be a mentor. People can be trained on courses but to be empowered they need to take new learning on at the job and use it. The three-way relationship between learner-employer-training is very important. Regular coaching conversations and career coaching are also very important. It's part of the pastoral care needed. In a small business it is too easy to overlook because people are so busy in the business."

- Providing cultural safety and care for multicultural workforces. Regional and rural employers said they wanted to be better at providing safe supportive environments for people from other cultures coming to Aotearoa New Zealand to work. This included refugee resettlement, understanding the religious needs of new migrants from diverse backgrounds, and social support for isolated families who may not have many members of their original culture nearby. In the face of re-opening the borders and seeing new migrants from cultures different to their own, they expressed a willingness to learn and a desire to be supported in that.
- Looking after, training and working with people from neurodiverse and differing physical capabilities also was raised.

> **"Some of the best people we've had have dyslexia but were so intelligent. Who helps the ones who are a bit different, how do we find ways to accommodate all skills/ cultures etc regardless of age, ethnicity, gender and academic level?**

> **People with disabilities are very undervalued in the sector. E.g. we have a paraplegic who does an amazing job out on the farm. She has trained her dogs to do all the mustering. The sector doesn't see that is possible. She has been a wake up re what people with a disability can do."**

- Looking after the mental health of their employees (and often their families who may be living on farms)

> **We teach skills like how to shear a sheep, but what is missing is mental health and resilience. We need to set up a community of learners and people that provide support to each other.**

- Managing remote workforces - something this sector has not been required to do in the past but has become more commonplace for Urban employers.

SECTION 5:

Phase Three

Drivers of Change

Out of the literature review and the interviews, we developed a working set of hypothetical "Drivers of Change". These were refined during the workshop process.

Drivers of Change are the megatrends and global forces which are believed to be shaping our future. Drivers of Change are those factors which bring change in the overall industry and society at large. They help us map plausible futures by identifying the fundamental forces that could impact a domain, such as the Food and Fibre Sector. These forces compel industry participants to alter their actions, and can change whole trajectories of sectors. They may be Social, Technological, Economic, Environmental or Political forces. Different sectors will highlight different drivers as being important or relevant at different times.

Drivers can be distinguished from Weak Signals which are local innovations or new products, events, and business models which might turn out to be trends in the future. A jet boat made from wool would be a weak signal - interesting and novel, but not yet even a trend.

Drivers are also different to Trends. These are frequent enough to be beyond the Weak Signal point, but not really a driver of change that is shaping the future. Demand for vegan food is a trend. We see that the number of people embracing full-time "veganism" isn't that large, but the growth of "flexitarianism" and the awareness of allergies, or the desire to reduce consumption of animal products for environmental or health grounds is a trend that has resulted in increased demand for vegan food. When there are vegan pies at petrol stations we know it is beyond the Weak Signal point!

Drivers are also different to Wild Cards - things that we really don't understand just how the impact will affect us. For example, these may be future pandemics or complex impacts of geopolitical conflicts on our global food system which may create unprecedented economic, ecological, and migratory pressures.

For this work, we have focused on the impact of Drivers of Change and what they will mean for the sector and therefore for Skills development and training. Combining these drivers into new combinations can give us insight into how the future might play out and what changes the sector will need to either shape or respond to. We combined multiple drivers in order to identify broad patterns of change.

Drivers Identified through this project

1. Tino Rangatiratanga and Mana Motuhake

Themes around Māori autonomy and control, sovereignty and self-determination came through

clearly in our interviews and the workshops. This included a growing strength in Māori Institutions, growth in the Māori economy and a desire for co-governance of many public entities. As Iwi and hapū settle Treaty claims, there has been an increase in Māori investment in land and both land and sea-based enterprises.

In 2021, Māori enterprises were a significant part of Aotearoa New Zealand's primary sector[1]. In 2018, Māori owned $23[2] billion in primary sector assets including 30% of all beef and lamb production. Moreover, Māori horticulture has grown 300% in 12 years[3]. According to Zespri, in 2022 at ~$4bn in revenue, kiwifruit make up 71% total value of global fruit exports from NZ, and Māori participation in the kiwifruit industry is approximately 10%.

Māori enterprises report being guided by Indigenous values of environmental stewardship, social responsibility, intergenerational wealth creation, and cultural revitalisation.

The use of mātauranga Māori and protecting it was widely discussed, along with a desire to see it recognised more widely in the sector.

> **"For many years colonisation was thought of as a 'civilising mission' under which knowledge and technology would flow from Anglo settlers to Māori. It has rarely been considered that learning, wisdom, and insight could flow the other way[4]. "Collectivising and agreeing together what our tikanga is, is important: growing according to the practices of tupuna, but also recognising western innovation."**

Māori-owned businesses employ more Māori than other organisations. Research undertaken by Te Puni Kokiri found that on average 43% of employees within businesses identified as Māori-owned are Māori, compared to 14% for non-Māori-owned businesses.

1 https://www.nzherald.co.nz/business/agribusiness-report-three-concerns-underpinning-maori-agribusiness N7BAMSISLFEBSEBLSL6MJYYC3U/.
2 https://www.mpi.govt.nz/dmsdocument/49066-Situation-and-Outlook-for-Primary-Industries-SOPI-December-2021
3 https://www.stuff.co.nz/business/farming/123625580/mori-horticulture-sector-grows-300-per-cent-in-12-years-to-be-worth-220m
4 https://ourlandandwater.nz/news/how-maori-agribusiness-is-leading-aotearoas-farming-future/

2. Demographic changes

The age distribution of Māori and Non-Māori populations in Aotearoa look quite different.

> **"Māori are a young population and will make up a much larger share of the working age population in the future. Between the 2013 and 2018 Census, the number of working Māori in Aotearoa grew to 105,000. That's a 50% increase in five years. This growth is predicted to continue. Rangatahi will be the backbone of the future of Aotearoa and we will all benefit from supporting them to be the leaders we know they are."**

Currently, 13% of the workforce are Māori. This number will be nearly 20% in 2040. Given the youth of the Māori population, we can expect a large proportion of those looking for training to be of Māori descent, couple this with post-settlement Māori investment into the Food and Fibre Sector and we see a need for skills development to take the needs of Māori learners into account.

> **"As growth in the Māori population and labour force continues, New Zealand will increasingly rely on Māori graduates and workers to meet future national skill needs[5]."**

Overall, Māori are overrepresented in the primary, manufacturing and construction industries, and substantially underrepresented in professional, scientific, and technical services, with 34% of forestry and logging workers being Māori[6].

Migration projections from Statistics NZ show that future migration is anticipated to come from India and China predominantly. The Asian population is projected to grow faster than the Māori population and surpass it in the early 2020s. The Asian and Māori ethnic group populations are both projected to surpass 1 million in 2024–2027 and 2028-2032 respectively. Māori population growth is driven by above-average birth rates combined with a young age structure, while the Asian population growth is driven by migration.

The Regional Seasonal Employer Scheme (RSE) has seen steady growth since it was introduced in 2007. NZ Employers may recruit from 9 eligible Pacific countries and bring workers to NZ for seasonal work. There were 8,000 places available in 2007, and 16,000 in 2021.

> **"A lack of local workforce means employers have to look overseas, e.g. to the Pacific and Philippines, and bring them in as permanent migrants. This is a good solution as they tend to stay here and are less likely to be a springboard to Australia. The problem is we don't invest in their training when they do arrive. We have an opportunity to capture people who have been here on a working visa in fisheries or farming. They roll their visa over year after year and it costs the workers a lot. We don't train them, or pay for their visas. They should get to level 4 and be able to qualify for permanent residency if they were trained. It would solve a lot of problems."**

With the borders effectively closed to immigrant labour for almost two years during the pandemic (2020/21), there has been large-scale employment in the sector causing widespread production issues.

3. Going Green

There are pressures of environmental change on food production - e.g. changing acidification of our seas and the impact on aquaculture; flooding on farmland; slash from forests affecting people downstream; reduction

[5] https://www.mbie.govt.nz/dmsdocument/18306-maori-and-the-future-of-work-tripartite-forum-background-material-8-november-2021
[6] https://www.berl.co.nz/our-mahi/future-maori-workforce-part-four

of soil and water quality; increased drought and high temperature. These all have an impact on productivity and profitability for Food and Fibre businesses. The impact of both climate change and mitigation steps to reduce said impact were seen as the major issues.

We also heard increasing calls for increased regulation in order to protect the "commons", and calls for decreasing or deferred regulation in order to increase production.

At the same time, there are premiums being paid to *some* farmers who are meeting customer desires around animal welfare, soil preservation, water management, regenerative agriculture and so on. There is growing interest globally in how farmers can be paid for the environmental benefits they can provide, from carbon sequestration to flood management.

> **"Sustainability is the key opportunity for the sector over the next 10 years - whatever is being produced and sold, how sustainable it is will be important to customers"**

4. Going Digital

Technology has become part of every production system. These technologies are increasingly becoming part of every single job at any point of the process from growing and rearing to harvesting and processing.

> **"We can lead the world in tech. e.g. virtual fences, telemetry on water troughs and drones to muster sheep, and in hort how we pick and plant, and in forestry how we harvest. Those are all likely to go high tech, professionalise and drive up wages – employers will be able to pay them more."**

These technologies all have a digital component, but they also involve hardware (eg in-vat testing, rainfall measurement) as well as software. The new technologies may also be improved genetics, automation (eg use of robotic pollination or picking in horticulture) and new machinery. Every part of daily life is affected by technology, and all participants talked about the increasing use of apps, remote monitoring, drones, etc in their lives and particularly at work. People saw this as creating a lot of opportunities for higher-skilled work, and also for remote work.

> **"The govt is promoting high skill, high tech, high knowledge – people don't see primary industry as able to do this."**

There is inequity in Aotearoa New Zealand with the speed and spread of these technologies, with adequate broadband still being unavailable in some regions. Without high-speed internet connections to every aspect of production, some regions are unable to operate at the same levels of efficiency as others leading to other potential financial inequities. Not only that, but some communities lack access to basic training in using technology and could find their workers miss out on higher-paying roles.

> **"Automation can improve conditions e.g. robotic milking. We need to ask how do we get rid of highly repetitive tasks that people don't want to do and make the job more appealing, reducing the people hours required? "**

KPMG's Agribusiness Agenda 2022[7] named delivering broadband equality to all as the sector's 3rd highest priority (after biosecurity and signing trade agreements).

Background from MBIE on the Future of Work with regards to Māori commented: "Current trends suggest that technological change seems to be slowing in New Zealand, not speeding up, with low rates of technological adoption and diffusion in the economy

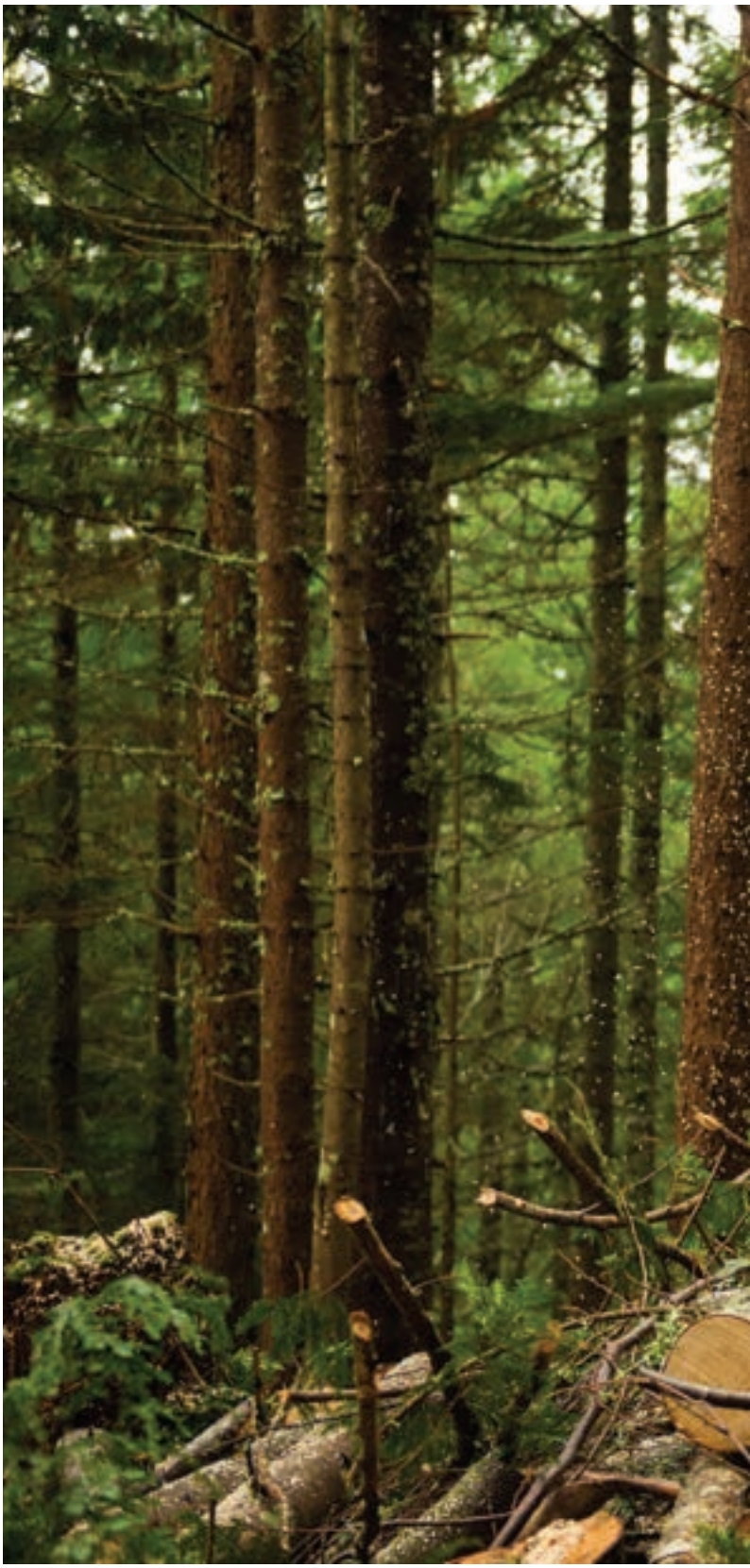
[7] https://assets.kpmg/content/dam/kpmg/nz/pdf/2022/06/agribusiness-agenda-2022.pdf

stifling productivity and income growth. As Māori are overrepresented in jobs that comprise a greater amount of basic and repetitive tasks, the Māori labour force may be at greater risk of displacement as tasks within these occupations shift towards more advanced skills.[8]"

Finally, there was a real concern that company directors of our corporations and kaumātua may lack the skills to provide adequate technology governance - whether in choosing the technologies or ensuring the best rollout of them. This concern was echoed in the Productivity Commission's report on "Frontier Firms"[9].

There was also a belief that while it feels like technology is accelerating, many parts of the Food and Fibre Sector are not investing, do not have access to broadband and other tools that would enable precision production, and may have difficulties (sometimes regulatory in the case of fisheries for example) in scaling available technology. They also lack access to the mechanisms (platforms, standards, protocols, economic and privacy models) to share the plethora of data that is available.

> **"Why are we milking cows at 4am? We used to because there was no refrigeration. Now we could quite easily milk only once a day. Twice a day is hard on the animals. If I were only milking once a day I could do other stuff on the farm. Even with horticulture - how do we make it easier, instead of having to carry heavy baskets of kai? It's easy stuff if people stop for a second and think."**



5. Value or Volume

One could assume that there was no debate in NZ over whether to be an efficient producer or a high-priced one: "The Country Calendar factor" as one farmer called it (the assumption that all of NZ's Food and Fibre companies are artisan niche players who

[8] https://www.mbie.govt.nz/dmsdocument/18306-maori-and-the-future-of-work-tripartite-forum-background-material-8-november-2021
[9] https://www.productivity.govt.nz/inquiries/frontier-firms/

produce small amounts for high-paying foreign buyers. Our discussions showed that many companies in Aotearoa New Zealand are looking to increase production and are looking for skilled staff to help to drive productivity. They see this productivity boost allowing them to feed more people (perhaps through increasing Dairy production) or provide fuel into a decarbonising economy (eg commodity wood products to replace coal).

> **"Our productivity – we need to invest more in capital i.e. tech automation etc to make jobs more attractive and increase our labour efficiency. We don't want to be the lowest cost labour industry in the world. The challenge is we need to re-orient ourselves and accept we are going to have to invest locally. "**

Higher-value companies are seeking niches where they can increase pricing and profit, often while decreasing costs of inputs (including labour, agrichemicals, and energy). These companies want to ensure that their employees understand the demands of premium customers and are able to deliver to them. These demands include compliance with standards such as GAP, or requirements for antibiotic-free production, organic certification, but also include breeding for intramuscular fat or flavour of fruit etc. They saw that a higher science component was required for the higher premium products, as well as compliance with standards.

6. The Gig Economy

The Gig Economy is a quickly developing labour market that is defined by short-term contracts or freelance work (as opposed to permanent jobs). Workers in a Gig Economy get paid for the "gigs" they do, such as food delivery or a car journey as opposed to a regular salary or wage.

> **"Most urgent is the need for a shift of focus from jobs to skills when considering the future of work". is the opening remark from 'Nau Mai Te Ānamata – Tomorrow's Skills'[10] report by Tokona Te Raki."**

There has long been seasonal work in the Food and Fibre Sector, with shearers working across both NZ and Australia in order to have full-year employment for example. RSE and Working Holiday Visa workers have been essential for a number of horticulture and viticulture businesses for the last 15+ years. Technology may also make it possible for the RSE worker of the future to live in India, China or the Pacific and operate NZ Food or Fibre production remotely.

On the other hand, many Māori were looking for opportunities to bring people home and to provide stable, year-round employment in order to keep people in the rohe. Some solutions included agreements between employers to "share" an employee throughout the year, or others where the employee might be rotated through several incorporation-owned sister companies - providing year-round employment, albeit in 3 different entities during the year.

The Productivity Commission identified the need for skills development in line with a high-tech gig economy: "...the training system should be made more accessible and flexible. While adult New Zealanders have high overall rates of training, more-qualified workers participate more than those less qualified. Regulatory and funding barriers make it hard for some people to gain new skills or upgrade existing skills. Rules restricting the funding, design and delivery of micro-credentials should be eased, adults should be able to borrow through the Student Loan Scheme for short-course tuition fees, and rules that require adults to enrol in full qualifications before they qualify for public funding should be removed."[11]

[10] https://yea.org.nz/wp-content/uploads/2022/06/TTR-Skills-Report-Final-003.pdf
[11] https://www.productivity.govt.nz/assets/Documents/0634858491/Final-report_Technological-change-and-the-future-of-work.pd

"The ideal workforce for the future is adaptive to change and has a core set of skills that can be applied to a range of contexts so that if we hit market shocks or variability – which we always have – our workforce doesn't become a casualty like a market or a product could. The ideal workforce is world-leading, aware of what is going on around the world, internationally connected, the best. We are able to sell that ability and knowledge and skill set through our innovations in products and services to the rest of the world."

The gig economy also puts more emphasis on employees to have transferable skills and to cluster skills into "packages" which help them advance. This statement from Nau Mai Te Ānamata: Tomorrow's Skills from Tokona Te Raki, Māori Futures Group explains: "We tend to think of work spheres in terms of industries — different jobs grouped by the sectors of society they serve e.g. manufacturing, hospitality and retail, corporate etc. This isn't very useful however when trying to understand the actual work undertaken in those jobs and the skills they require. Skill clustering allows us to group jobs by the similarity of skills required across different jobs. By doing this we can see how certain skills can help whānau move across industries within skill clusters, or identify their key skill set, and where the opportunities are to move into a different skill cluster".[12]

"All the work is different which makes it cool, but a lot of employers say they want standardisation across pathways, so they can understand what people can do. There should be clear pathways so we are not hamstrung by the qualification system, but it is there to serve us. e.g. you can't have an apprenticeship in forestry silviculture because there are not enough credits at level 4 to make it happen. That is dumb. I should be able to have an apprentice. It's bureaucratic. And I often have to log qualification units for my people that they will never use in order to get enough to get a credit. I can't get a single qualification for workers to cut trees as well as fly a drone because they are seen as different – that has to stop. A worker should be able to cut trees and fly drones, and get recognised for it."

[12] http://www.maorifutures.co.nz/wp-content/uploads/2022/06/TTR-Skills-Report-April-2022.pdf

SECTION 6:

Phase Four

Workshops

The workshop design used the Drivers of Change in order to create multiple scenarios. Drawing on the theoretical work of Schoemaker[1] and others[2], we asked participants to help us create scenarios as a form of strategic foresight. By delving into how the Drivers of Change may interact in the future, it might be possible to foresee and envision what the future of the sector might look like.

The workshops also drew on the work of Sohail Inayatollah, in particular his Causal Layered Analysis[3]. His approach to strategic foresight assumes there is more than one possible future. Using participatory techniques, and allowing for disagreement, his approach provides an opportunity for a multiplicity of views to carry weight and be heard. His methodology encourages the examination of different worldviews, narratives, and metaphors which make it useful in bicultural settings.

Approximately 300 people were involved in the workshops and development of scenarios. We designed a series of 14 workshops, mostly in-person but also online, around the country. The workshops were very well attended (approximately 300 participants were involved), and all parts of the sector were represented.

Over 100 participants attended or provided feedback to draft conclusions of this report.

We asked each workshop to analyse different combinations of Drivers of Change in order to elucidate insights into how different futures develop.

We explored multiple scenarios based on our Drivers of Change. At the workshops, we used “scenario analysis” in order to crowdsource ideas about alternate futures. We created scenarios out of the Drivers of Change identified in the previous phases and dug in deeply in order to understand how various scenarios might play out in NZ.

Scenarios explored the joint impact of various uncertainties, which stood side by side as equals. For example, we asked people to help us to describe the future of the Food and Fibre Sector under combinations of impacts of the following drivers:

---

1 https://www.ftms.edu.my/images/Document/MOD001074%20-%20Strategic%20Management%20Analysis/WK4_SR_MOD001074_Schoemaker_1995.pdf

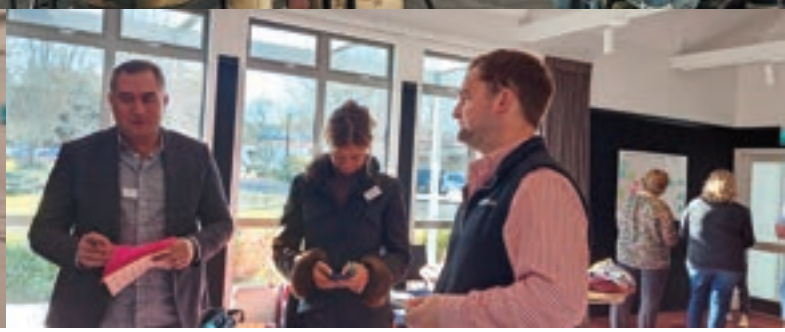
2 https://www.sciencedirect.com/science/article/abs/pii/S0040162503001525?via%3Dihub

3 Inayatullah, S. (2008). Six pillars: futures thinking for transforming. Foresight, 10(1), 4-21

- Increasing Māori ownership of the sector vs Increasing Foreign Ownership
- Increasing participation by Māori in the sector's workforce vs increasing migrant or foreign workforce
- Steady rollout of technology vs accelerating the rollout of higher technology
- Less vs more environmental regulation (as a proxy for "Going Green")
- Stable employment vs increasing "gig" work
- Increasing productivity and volume of goods vs decreased production and increasing premiums paid by customers.

Teams of participants worked together to brainstorm the combinations and created boards with post-it notes which were presented back to the whole group. Scribes were provided where needed. Our visual facilitator summarised each session.

The scenarios were mixed up around the country, with us repeating combinations in order to obtain new insights. These scenarios helped us to identify aspects of different possible futures that combined preferred, unwanted, integrated and transformational futures. We did not seek to envision a desired or perfect future.



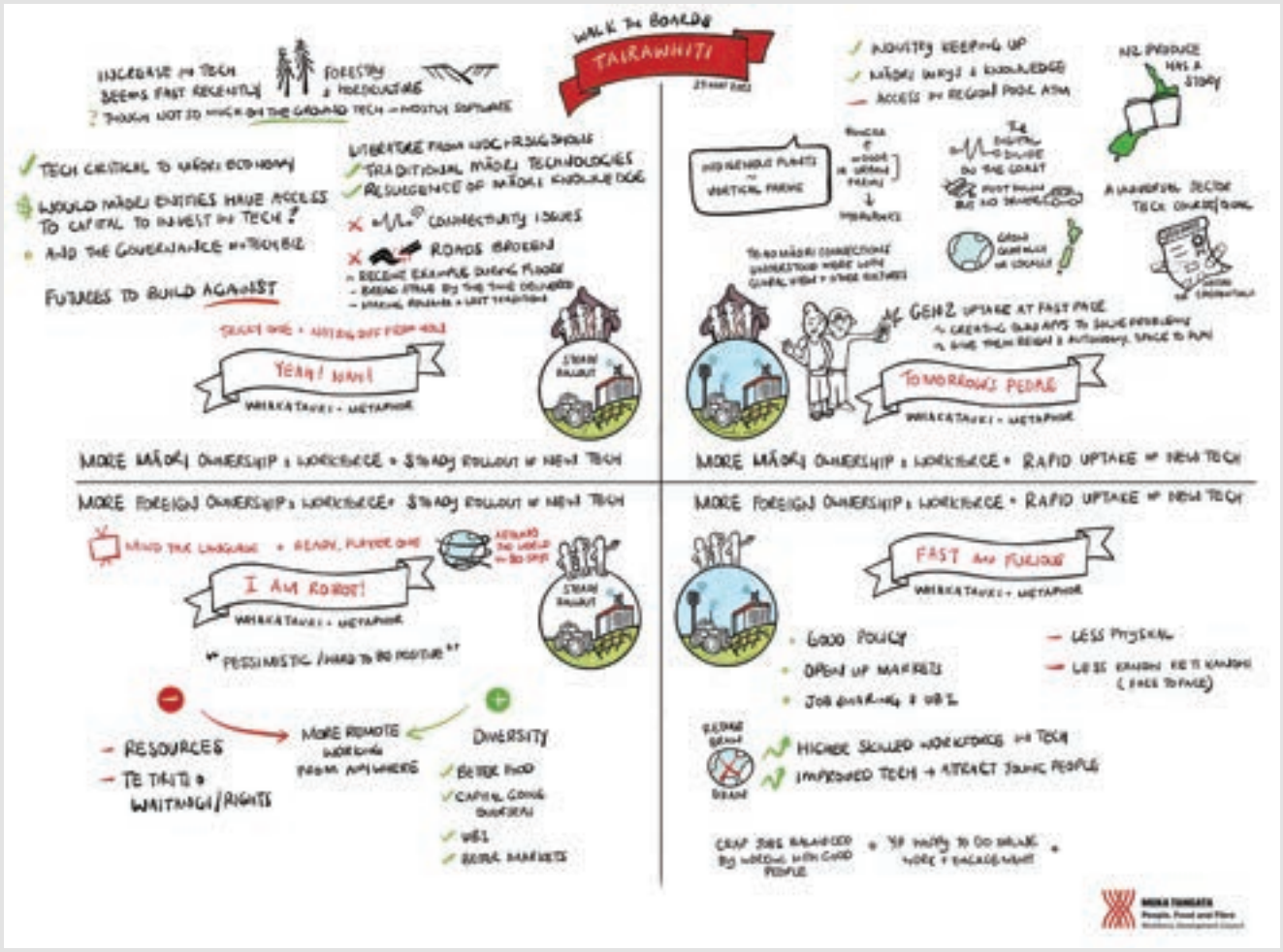
We then used aspects of Sohail Inayatollah's[4] Causal Layered analysis to have the groups identify metaphors or whaktaukī that provided an insight into the "future" created. We used those metaphors to engage in deeper conversation with the community. These conversations gave us an excellent depth of understanding as to how they saw the future playing out. They further provided us with the titles of the four alternate futures we identified.

Here are some examples of outputs from a few of the sessions, as captured by our visual facilitator.

---

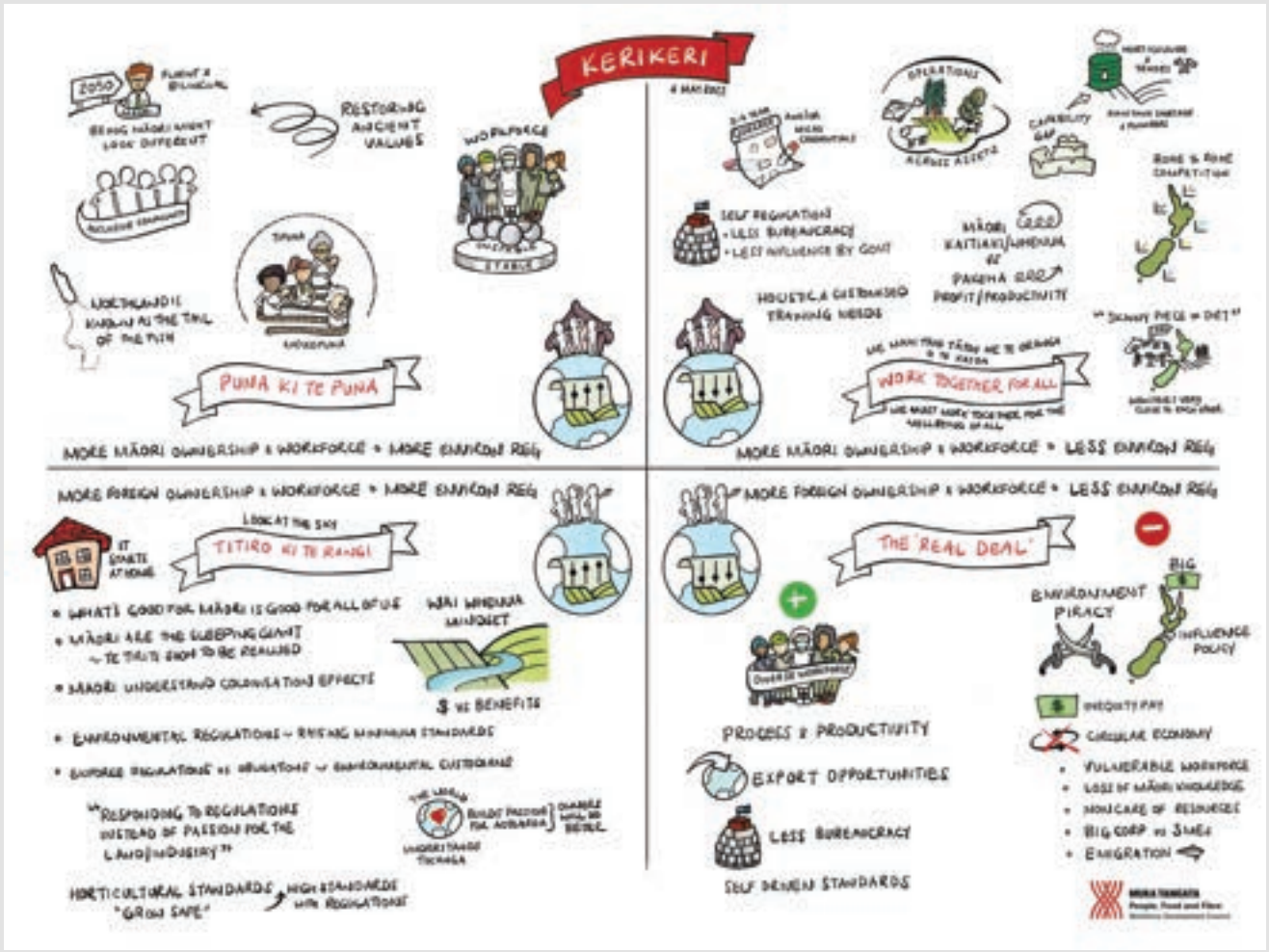
4 https://www.metafuture.org/causal-layered-analysis-an-integrative-and-transformative-theory-and-method-2009/

Tairāwhiti | Gisborne

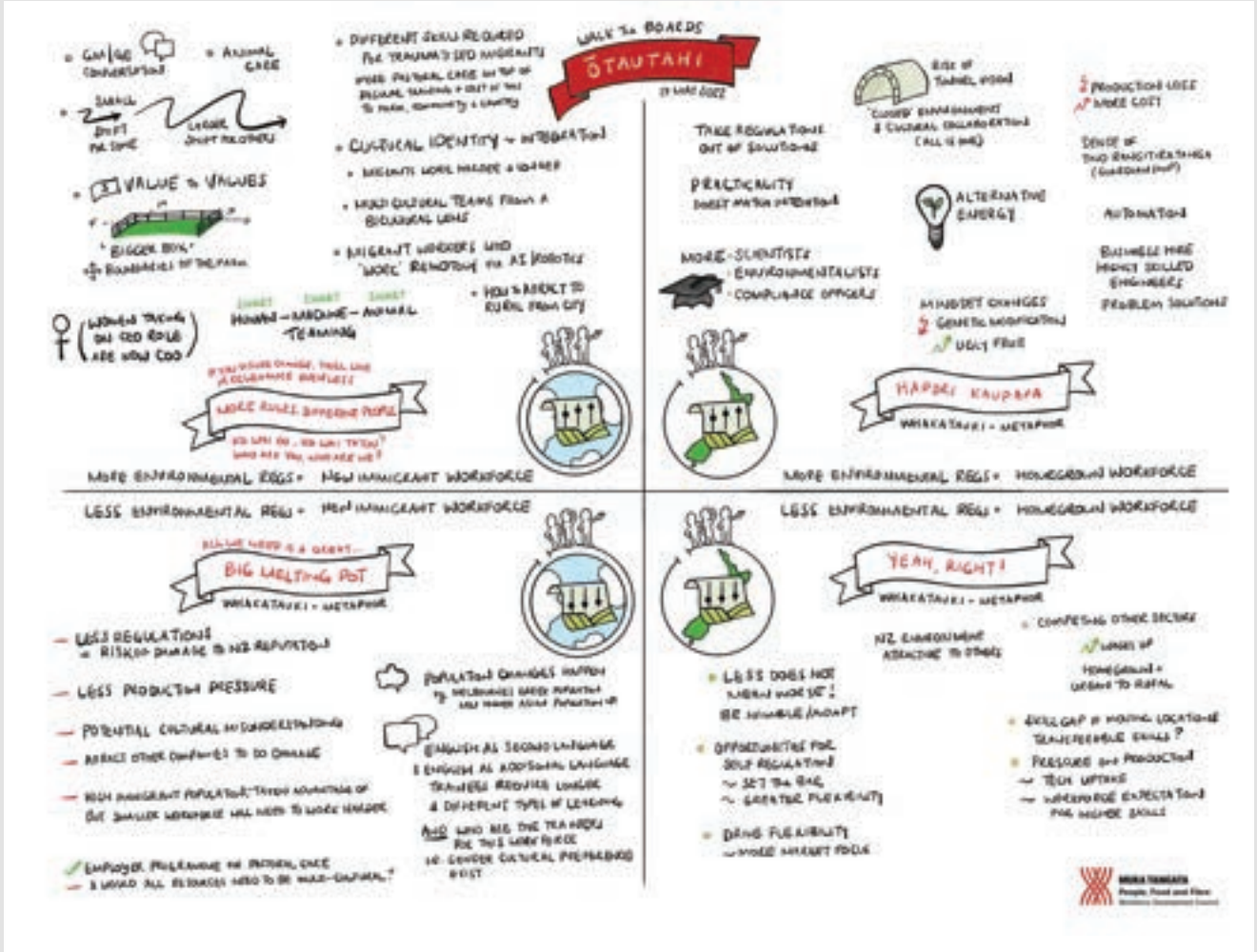


Kirikiriroa | Hamilton

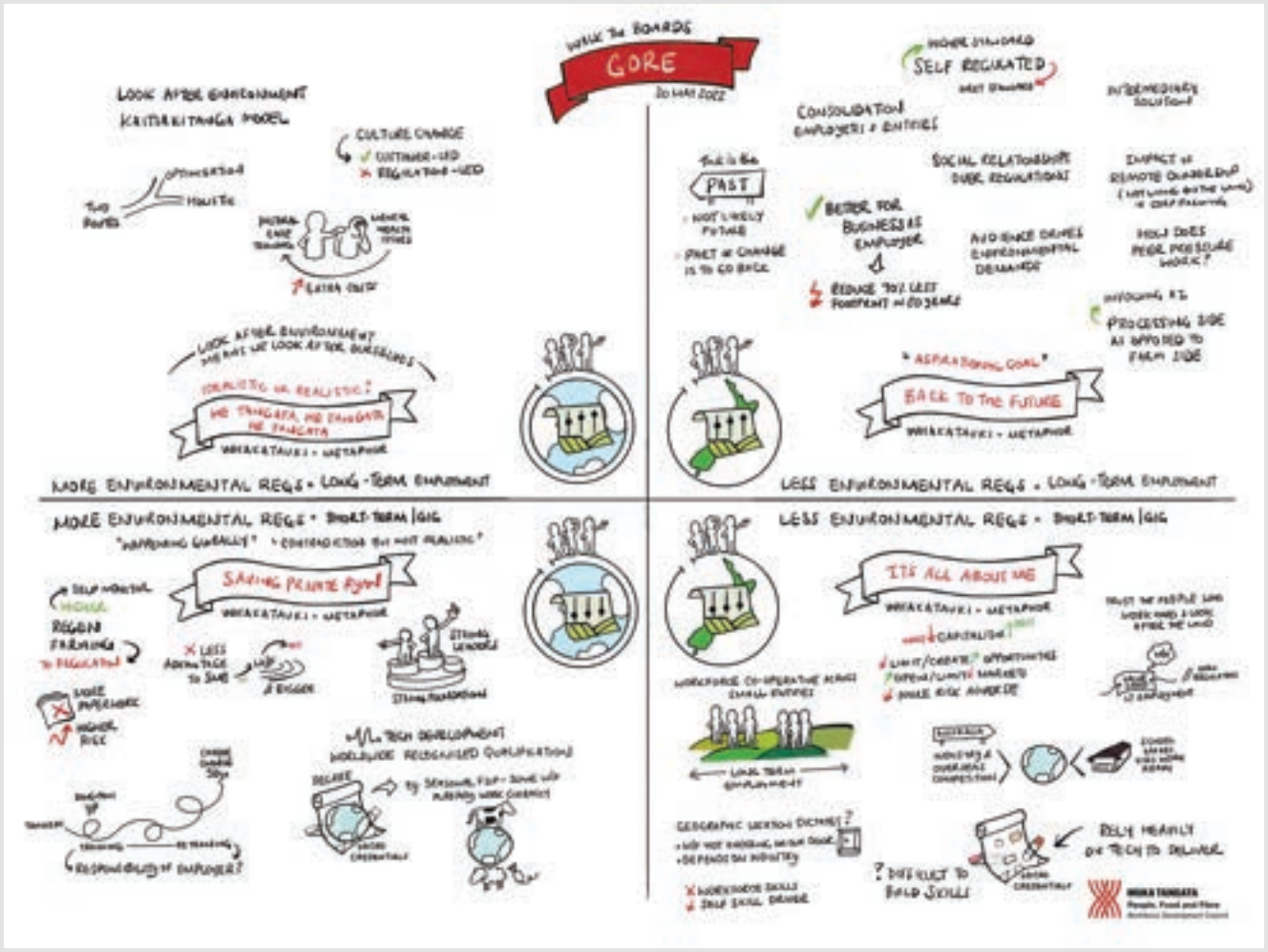
Kerikeri



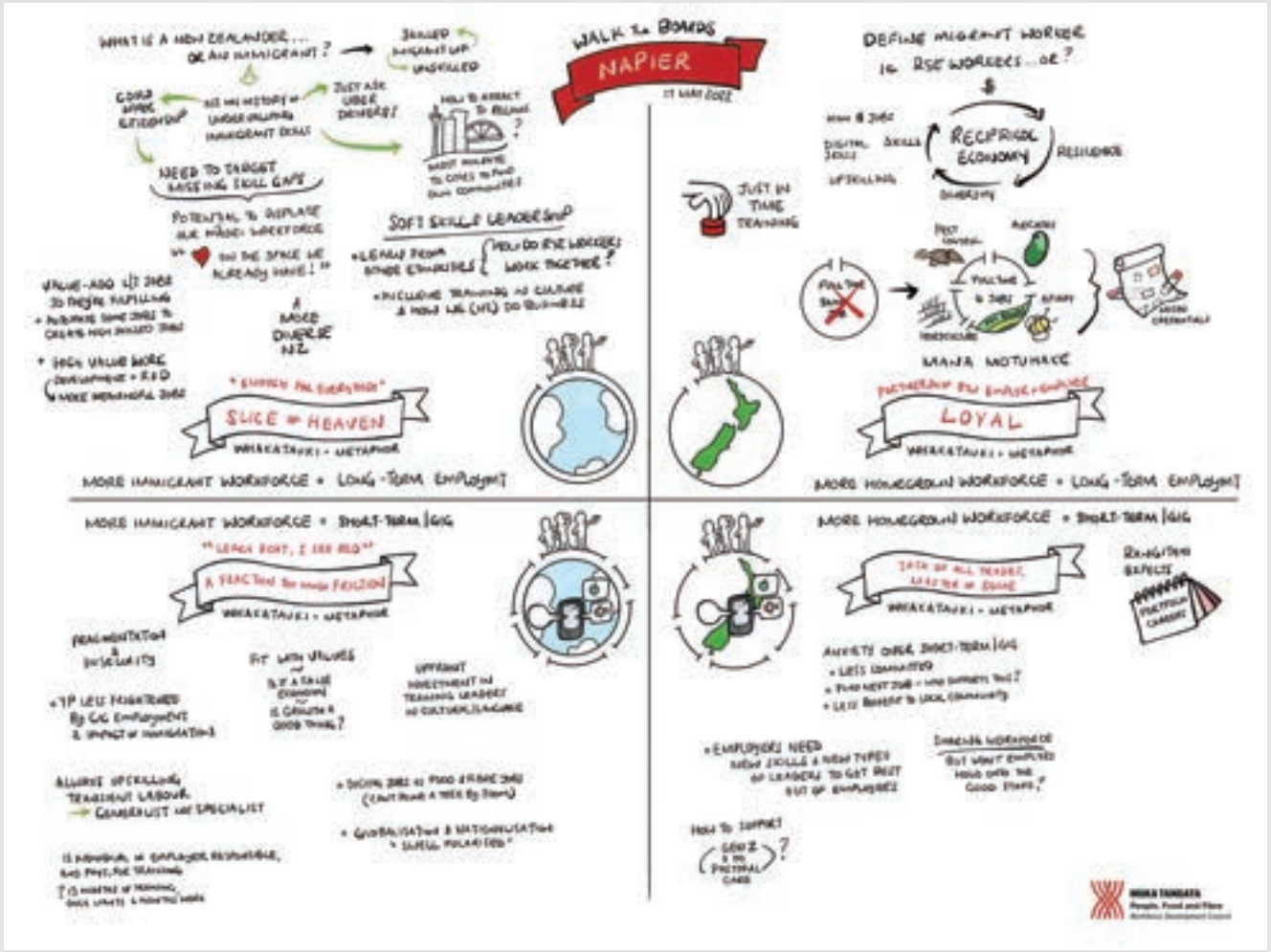
Ōtautahi | Christchurch



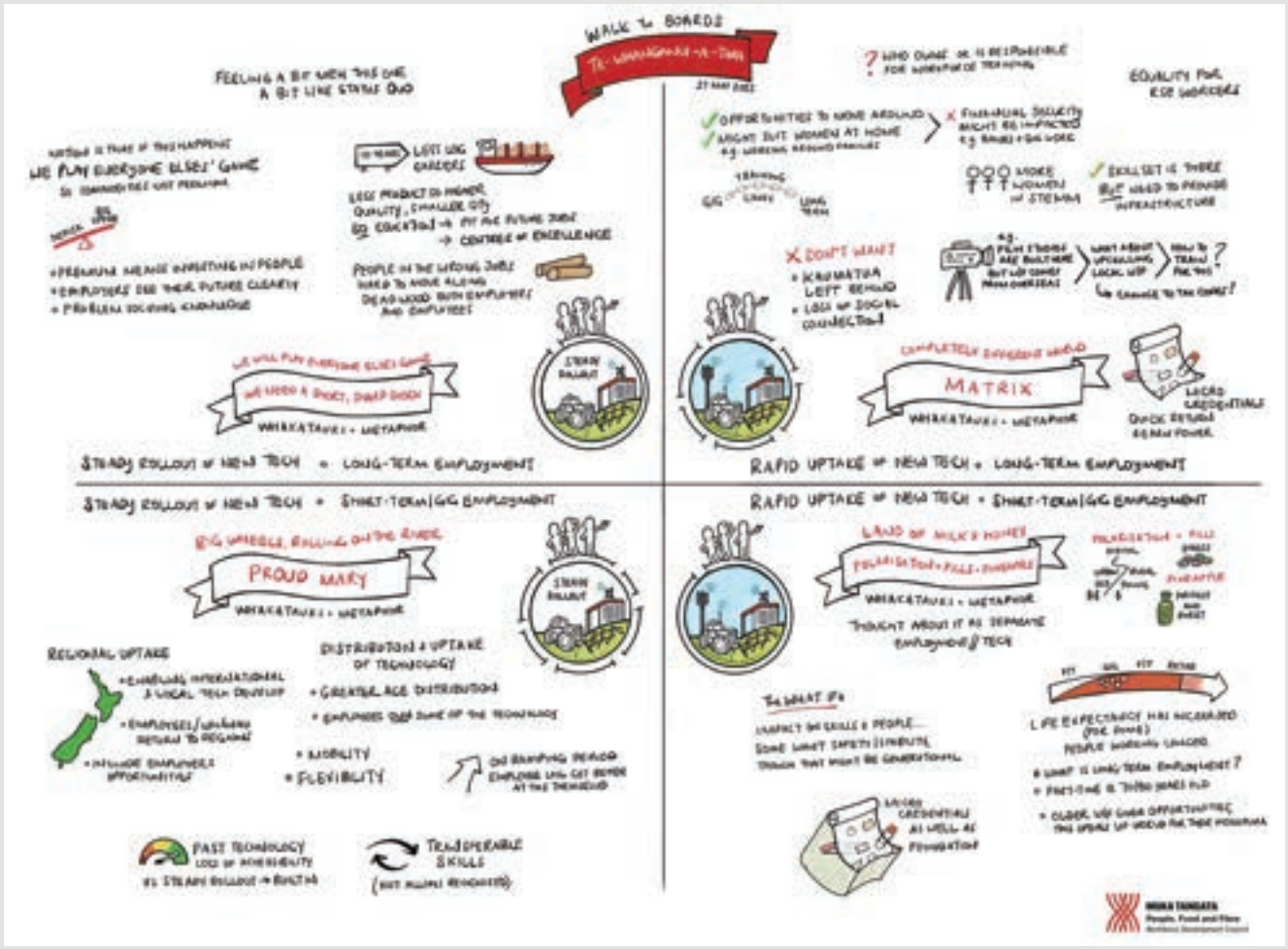
Maruawai | Gore



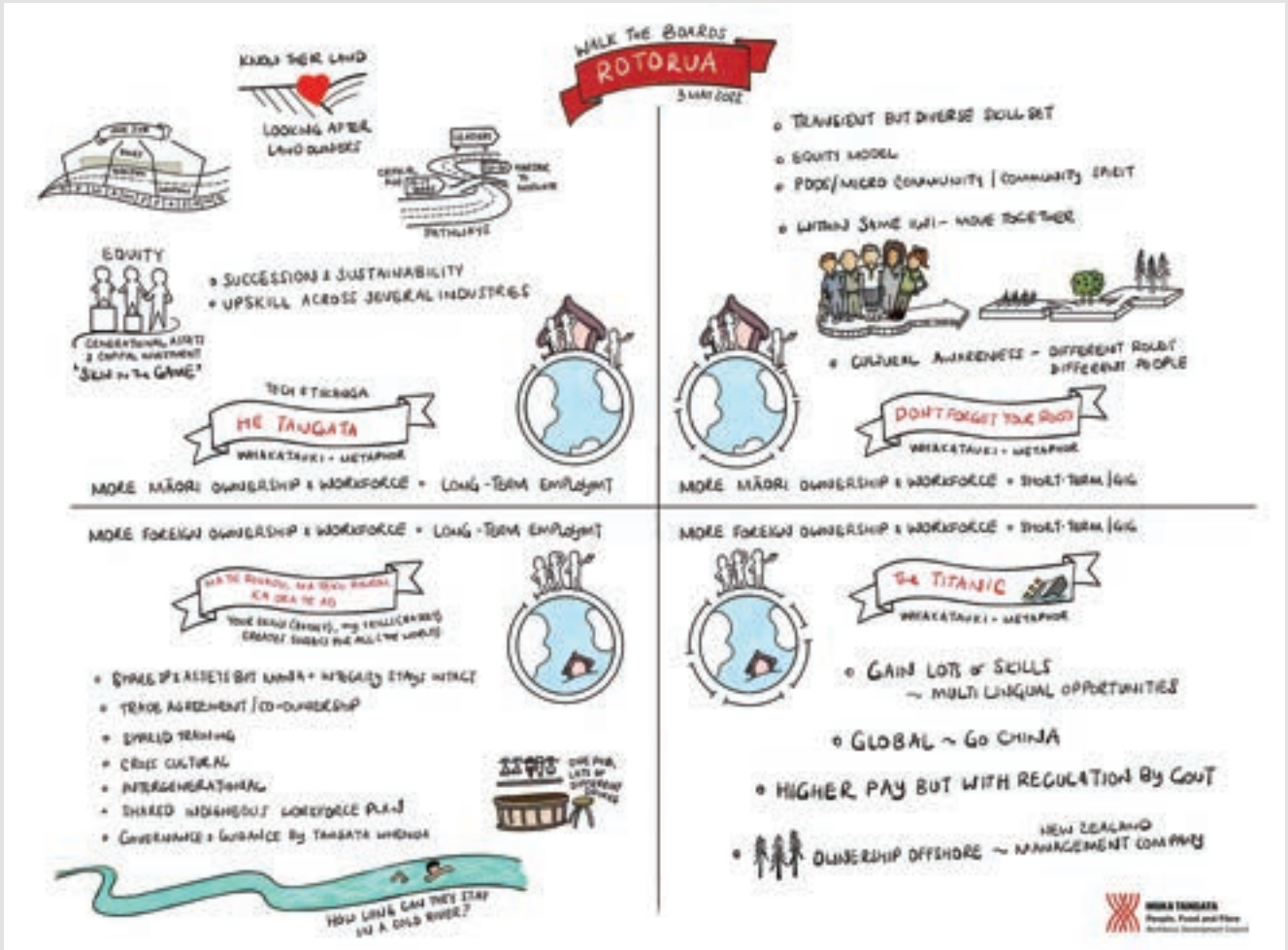
Ahuriri | Napier



Te Whanganui-a-Tara | Wellington



Rotorua



A specific online session with young people was organised by Muka Tangata (with strong participation from Dairy trainees). They spoke about their aspirations for themselves and the sector, and how they like to learn. We used Mural so they could capture their thoughts themselves.

SECTION 7:

Phase Five

Alternate Futures and Possible Strategic Responses

This report puts forward four potential scenarios to challenge our thinking and spark discussion within Aotearoa New Zealand about how to respond to the six Drivers of Change, and what this might mean for our workforce. So often we prepare for our preferred future, without taking time to stop and wonder what other futures might occur. We hope this thinkpiece will help to shape alternatives for how we think about the Future of Work for the Food and Fibre Sector, the workforce needed, and the kinds of skills and capabilities needed.

The titles of these four futures were provided by workshop participants, as metaphors for the future they envisaged. These are not preferred futures, they are possible ones. The actual future will likely contain combinations of elements from each.

Our Four Alternate Futures

These alternate futures have been created to be different enough from each other in order to provide insight into possibilities. We are not suggesting that any one of these futures is more likely than any other. We can use these alternate futures to push ourselves to think beyond a preferred future that some in the sector may want. Rather, we can think about different desired and unwanted futures as well as transformational ones that are currently outside of our line of sight. This can be useful to Muka Tangata in that they might question their assumptions about who needs to learn what, and where. These futures, as are many provocations, are not forecasts and should not be read as such. What actually happens is less important than sparking discussion so that we might prepare. The strategic responses to these alternatives are where things get really useful.

Background to the scenario development

We used a scenario technique whereby we created multiple sets of possible futures by combining different Drivers of Change in order to elicit conversation from the community about how different futures might play out. For example, what if there was more Māori ownership and Workforce in the future vs More Foreign ownership and workforce? What would the future be like if that continuum was combined with a steady rollout of new technology vs an accelerated one? Or if there were more or less emphasis on environmental regulations?

Four Futures

Puna ki te Puna

Yeah, Nah

Nāu te rourou, nāku te rourou, ka ora ai te iwi

Slice of Heaven

The Four Alternate Futures

Puna ki te Puna – Tipuna ki Mokopuna

This future is one in which Māori entities increasingly own land- and sea-based industries in Aotearoa New Zealand. In particular, Māori entities use treaty settlement money to buy and use land to grow wealth and jobs for their whānau. Those investments cover horticulture, viticulture, forestry, arable, sheep, beef and dairy, and more.

In some areas, Māori entities further develop aquaculture (including seaweed, kaimoana and fisheries) or fish processing. The number of workers identifying as Māori increases both in quantity and the percentage of the workforce. We also see Māori entities invest in their people, as they attract more young people home to the regions. Those entities want to see their people access higher-paying jobs, increasing whānau wealth through the acquisition of higher skills.

There is a strong desire to return to ancestor systems for the production of kai, relying on old wisdom and mātauranga alongside western science.

The return home for many Māori means stable employment, often close to their own marae. The pull from home is increased by job and training opportunities, and the possibility of practising Te Reo and tikanga in daily life.

Higher environmental regulation and protection are the new status quo, with a strong drive from the regions to produce premium products and services consumers are after. Those premiums are reinvested in the people and the land, and therefore profit is preferred over revenue.

Unfortunately, the rollout of high-speed internet and new technologies remains limited. This leaves many rural communities with limited access to new technologies. Those constraints mean ongoing issues such as access to basics (cellphone coverage, broadband) seriously hamper productivity and job prospects. The digital divide between urban and rural areas continues, with those rural communities with the most Māori faring the worst continuation of inequities across the digital divide. This hampers rural and Māori aspirations and proves to be an ongoing source of frustration. Kaumātua seek training in digital governance as they consider investing directly into internet and other technologies.

Yeah, Nah

In this future, we see an increase in foreign ownership of the primary sector, including fishing quotas, forests, equine and dairy production.

Alongside this foreign investment, there is an increase in the number and percentage of new migrant workers, largely originating from China and India. Climate refugees from the Pacific and elsewhere in South Asia are also seeking work in Aotearoa New Zealand, with uncertain residency conditions.

We find an increase in the “gig economy”, where people have multiple jobs either throughout the year, sequentially, or concurrently (i.e. holding down several roles in order to make a living). There is also an increase in casual contracts, and self-employed contractors hiring themselves out (in a similar way to how the film and gaming industry works now) and having to provide for their own PAYE, ACC etc. Employees are largely responsible for their own training and maintaining a skills base, as the workforce becomes more fragmented. Micro-credentials help workers remain adaptable and hireable into a range of roles across the seasons.

There has been pressure to slow the speed of increase of new environmental regulations (delaying entry in the ETS, for example, and carving out exemptions for the Food and Fibre Sector from water and soil regulation). This results in less demand for science and engineering skills, as compliance is deferred, and innovation slows.

Good productivity gains and a slower increase in compliance costs mean there is an increased volume of production and higher revenue for producers. There is also been a steady investment in new technology which helps to drive production and productivity gains. Transformational technology is delayed as producers wait for the right time to make big changes.

Nāu te rourou, nāku te rourou, ka ora ai te iwi

This future is largely an extension of the status quo. Producers across the sector are operating different strategies, with some increasing production while others are chasing higher premiums for their products off lower production.

There is an uneven ability to invest in new technologies (including drones, artificial insemination, genetics, robotics and automation). Where investment does occur, those producers gain even higher levels of productivity, increasing the spread of profitability across the sector.

While there is a steady increase in the breadth and range of environmental regulation, we see a good number of companies going over and above those minimum standards in order to achieve premium niche pricing in offshore markets. Compliance costs rise leading to an increased demand for science, testing skills, and innovation in technologies for managing externalities (including for aquaculture, horticulture, forestry, greenhouse cultivation, and dairy).

The demand for workforce sees Aotearoa New Zealand welcome climate and other refugees into regional areas. This migration is supplemented with workforce from the Pacific, India and China. Migrants appreciate being helped to find their way in a bicultural country where they also find their own cultural and social needs and practices are supported in their new communities.

Companies that have invested into new technologies find that they can engage workers offshore, who stay offshore, to operate and monitor equipment remotely. In some cases, these are casual and/or seasonal workers. The use of remote workers in turn increases the productivity of those operations.

Slice of Heaven

This future is one in which there has been an increase in local ownership of producers. These are made up of (post-settlement) Māori entities, family businesses, some co-operatives, and socially and environmentally responsible corporates with ownership across land- and sea-based production.

There is an increase in Māori workforce across the sector (in numbers and as a percentage), supplemented by workers who live offshore.

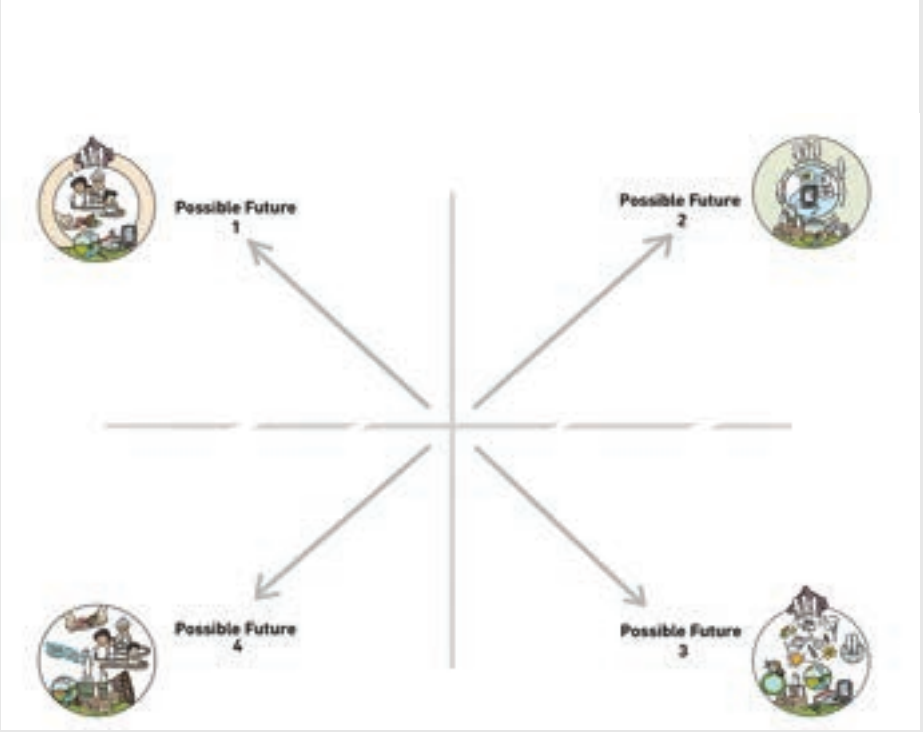
The uptake of technology increases rapidly and enables more workers to work from home (on- or offshore). There is a widespread use of drones, remote monitoring of quality and compliance, along with applied genetics and breeding. Autonomous vehicles and robotics are ubiquitous across operations such as forestry, aquaculture, horticulture and milking. Pollination is undertaken remotely using robotics in many operations, along with pruning and picking, with operators working remotely and being selected for their gaming prowess.

High levels of environmental regulation lead to innovation in climate-friendly, low water production techniques and soil conserving technologies. High levels of adoption of these technologies by commodity producers see them increase production while decreasing emissions and direct costs, particularly in dairy and forestry.

Increases in profitability lead to a growth in the pool of locally sourced capital for reinvestment into further profitability and even better technology.

Employers seek to retain staff in their region or rohe throughout the year. This proves especially important in attracting highly-trained science and engineering graduates. Employers provide and fund training in order to ensure their capital-intensive equipment is managed well, in optimal use and producing the required results.

Māori and other employers invest heavily into their people, in order to retain them in a competitive labour market, and also out of a desire to increase access to greater wealth for whānau through higher skills and opportunities.



Strategic Response Implications for Workforce Development and Skills

The future as it actually happens is likely to be closer to the centre where aspects of each of the plausible futures come into being. In designing these, we were not looking to identify a preferred future, or even the most likely. This is not a forecast. What matters most is what we do about it so that as we walk into this future we are ready to think about the strategic responses required. This will give us resilience and perhaps open our eyes to options we had not previously considered. The present is messy and contradictory, and the future is likely to be similar. Muka Tangata could take these different futures into account when thinking about advice and design going forward.

Puna ki te Puna - Tipuna ki Mokopuna (Being a Good Ancestor)

An increase in Māori ownership in land and sea-based industries (particularly post-settlement) and an increase in Māori workforce across the sector (both in numbers and proportion); Māori employers investing in their people, with a particular desire to increase access to greater wealth for their families through higher skills and opportunities workforce; a return to ancestor knowledge systems for the production of kai (mātauranga in action); stable employment (often close to home marae); higher environmental regulation and protection than is the status quo; a strong drive towards premium pricing for the products and services being produced; a continued steady rollout of new technology, with access to technology being constrained by ongoing issues such as access to basics (cellphone coverage, broadband) continuing to be less in Rural communities, particularly those with large Māori populations, and assuming a continuation of inequities of access and the digital divide.

Focus on

- Design for Māori learners and Teachers: “If it works for Māori it works for everyone”.
- Te Reo and Identity
- Governance and Employer training will be needed
- Compliance monitoring and training will be key
- Remote training may be difficult to do where Māori and rural communities remain unable to access high-speed internet or have access to larger devices. Phones may be the hardware of choice.

- Cohort and social online learning including submission of co-operative project work
- Practical, on-the-job training combined with theory and access to qualifications
- Ability to take skills across sub-sectors (eg horticulture to fisheries)
- Hapu-based systems mean that different solutions may work for different places
- Opportunities for multigenerational learning: Akonga are not just Rangatahi. Learning should involve “kaumātua to pepi”, especially in marae settings. Both lifelong and intergenerational learning matter.
- Workforce development isn’t linear - people will move between sectors eg hops to kiwifruit to aquaculture.
- Literacy, Numeracy support plus support for people with learning difficulties and where the school system has failed them.
- Understanding how market signals drive premium prices and that niches provide higher profit vs revenue (leading to a need for financial literacy)
- Many Māori participants wanted to see Marae and wānanga-based learning, including opportunities for dirty hands (ie practical experiential learning).

Yeah, Nah

An increase in foreign ownership of the primary sector, fishing quotas, forests etc; an increase in new migrant workforce largely originating in India and China (including climate refugees from the Pacific and Asia); an increase in the Gig economy where people have multiple jobs (either concurrently, or through the year), and casual employees, or self-employed contractors; less speed in increasing environmental regulation (possibly deferring entry in ETS, delaying water and other regulation for the Food and Fibre Sector); good productivity gains meaning increased volume of production and increased revenue for producers; steady but not transformational access to technology that assists increase in productivity. Employees are responsible for their own training as the workforce becomes more fragmented.

Focus on

- Multicultural skills and sensitivity training
- Pastoral care - mental health and community integration
- Residential training will make sense for many including new migrants and those coming from urban backgrounds/new to living close to the land
- Learning about The Treaty/Te Tiriti and what it means to be a new New Zealander
- Working smarter in order to lift productivity
- Individual training records, portability and access to microcredentials
- Ability to mix and match microcredentials from different sectors into qualifications
- ESOL support, along with Literacy, Numeracy support
- Vocational, on the job apprenticeships and training
- DIY taxes, managing my own career, personal financial management
- Designing a portfolio career
- Just-in-time micro-credentials
- Skills for dealing with change and in an increasingly volatile world - adaptability, flexibility, creativity and foresight
- Quality assurance and the ability to ensure things are done right every time
- Steady rollout of technology requires solid technical and science skills
- Allow for individual learning styles, including neurodiversity

Nāu te rourou, nāku te rourou, ka ora ai te iwi

We see an extension of the status quo, where there are players operating different strategies increasing both premium and commodity production; environmental protection and regulations increase; companies go over and above those regulations and standards in order to achieve premium pricing from niche offshore markets; increased regulation also leads to increased innovation and use of technology at all levels of production; climate refugees are integrated into our rural and regional economies and they appreciate being welcomed into a bicultural nation, and equally find their cultural needs and practices are supported in their new communities; some work is done by offshore (sometimes seasonal and/or casual) workers who operate and monitor equipment remotely.

Focus on

- Multicultural skills and sensitivity training
- Pastoral care - mental health and community integration
- Online Learning about The Treaty/Te Tiriti and what it means to be a new New Zealander
- Support for those with learning difficulties where the school system has failed them
- ESOL
- Remote training
- High technology skills - monitoring for compliance to NZ and consumer standards
- Managing asynchronous or 24-hour teams
- Science and technical roles eg environmental monitoring, managing artificial insemination and other genetics, installing, maintaining and using remote sensing (eg for aquaculture)
- Robotics may be able to be operated remotely, but maintained locally - both of these will require mechanical and engineering skills

Slice of Heaven

An increase in made up of Māori owned (particularly post-settlement), family business and socially and environmentally responsible locally-owned corporate ownership in land and sea-based industries, combined with and an increase in Māori workforce across the sector (both in numbers and in proportion); supplemented by offshore workers who live offshore and use high technology in order to operate remotely (eg drones, remote monitoring of quality and compliance; increase in autonomous vehicles/farm equipment operation, robotics for horticultural processes, including pollination, pruning and picking); high environmental regulation leading to innovation in climate-friendly production; higher adoption of this technology leads to higher productivity for commodity producers (eg forestry, dairy); employers co-operating in order to keep workers employed throughout the year in their rohe and towns; employers provide training in order to ensure their capital intensive equipment is managed well and in optimal use; locally sourced capital reinvested into growing profitability; Māori and other employers investing in their people, with a particular desire to increase access to greater wealth for their families through higher skills and opportunities and workforce.

Focus on

- Design for Māori learners and Teachers: “If it works for Māori it works for everyone”.
- Cultural competency
- Māori learners in particular are looking to be upskilled in Te Reo, non-Māori are too.
- For Māori learners, there is a desire to strengthen ties with their cultural identity, and to learn mātauranga alongside other forms of knowledge.
- Innovation and creativity
- Community building
- Interpersonal skills - managing coalitions, communication and cooperation
- Compliance and science training
- Upskilling into higher qualifications, more specialised or leadership roles
- Deeper Science and Technical skills
- Mātauranga Māori recognised but not appropriated
- Opportunity for community and cohort learning
- Skills for dealing with change and an increasingly volatile world - adaptability, flexibility, creativity and foresight
- Online learning
- Regular kanohi ki te kanohi (face to face) social and learning events
- Allow for individual learning styles, including neurodiversity

SECTION 8:

Conclusion

We are excited that Muka Tangata asked these questions, and engaged in such a deep conversation with the sector.

The ideas here will be used to stimulate more discussion, and to feed into both Muka Tangata's advice to TEC and the development of its strategy.

We have provided Muka Tangata with a number of reports and report backs along the way, and checked our insights with the community via a very well-attended feedback session. Muka Tangata staff around the mōtu joined workshops and calls and gained relationships and insights they did not previously have.

Muka Tangata hosted all of the events, and we believe they really did achieve a higher profile through this, and developed national and sector-wide relationships that will hold them in good stead in the future. We were disappointed that there were not a lot of Rangatahi, akonga or other young people in the sector involved. If this work gets taken up further, we recommend putting a specific programme together that targets young people, employees and also people who are not already in the sector. Deeper dives into the aspirations, views and preferences of young people, Māori and non-Māori would be fruitful for future efforts.

The Food and Fibre Sector is dynamic and exciting. The Drivers of Change we identified leave it with a number of choices to advance becoming bicultural while welcoming foreign labour; to be guardians of the land, or to use it in developing wealth; to grow people, or to have them build productivity; to work to avert or adapt to climate change quickly or slowly; to develop and sell premium products, or to grow more of them. Each strategic choice brings a different lens to the workforce needed and the approach to developing that workforce. What we can all agree on is that we are in this together, and the future will never quite turn out the way we hope or think.

We feel so privileged to have been part of this very important conversation.

Nā Melissa Clark-Reynolds,
Futurist, FutureCentre.nz

Appendix 1:

Rangatira Industry Leader Interviews

A total of 24 stakeholders from the sector were interviewed including 10 members of the Muka Tangata Council. They were

Alexa Forbes, Councillor - Otago Regional Council, Sustainability Advisor - Centre for Sustainable Practice

Andrea Leslie, GM Education and Engagement -Primary ITO

Bernadette Kelly, GM People, Safety and Engagement - Pāmu, MT Council member

Bill Kaye-Blake, Principal Economist, NZIER

Cathy Webb, MT Council member, Seafood Standards Manager - Seafood NZ

Charlotte Severne, Te Tumu Paeroa, the Māori Trustee

Chris Lewis, member Waikato RSLG, board member Federated Farmers

Dirk Steeneck, Dairy workforce project leader, Pāmu

Emma Boase, Manager PwC

Erin Simpson, Chair Muka Tangata, Capability Development Manager - NZ Apples and Pears Inc

Geoff Taylor, MT Council member, Strategy and Investment team DairyNZ

Grant Edwards, Vice Chancellor, Lincoln University

Hugh Good, Global Market Intelligence and Research Manager, Beef + Lamb New Zealand

Iani Nemani, MT Council member, Ministerial appointee to the Human Rights Review Tribunal

Jeremy Baker, CE, Muka Tangata

Kevin Ihaka, Dir - Forest Protection Services, Deputy Chair Muka Tangata

Kiriwaitingi Rei, CEO Māori Investments Limited, Deputy chair Māori Kiwifruit Growers Inc

Mavis Mullins, Director, Atihau Whanganui Inc and chair, Rangitane iwi

Nick Robinson, Strategy and Investment Leader, DairyNZ

Paul Crick, MT Council member, chair National Farmer Council Executive Beef+Lamb NZ'

Rukumoana Schaafhausen, chair, Miro Berries and Waikato Tainui

Traci Houpapa, Chair, Federation of Māori Authorities

Warwick Tauwhare-George, MT Council member, CEO - Parininihi ki Waitōtara

Appendix 2:

Reports consulted during Literature Review

National Agricultural Workforce Strategy Literature Review
Australian Government- Department of Agriculture, Water, and the Environment (January 2020)
https://haveyoursay.awe.gov.au/53281/widgets/276752/documents/136878

Food and Fibre Workforce: Snapshot
Primary Sector Workforce Dataset and Forecasting Working Group, (December 2021)
https://www.mpi.govt.nz/dmsdocument/50932-Food-and-fibre-workforce-Snapshot

Food and Fibre Skills Action Plan 2019-2022
Ministry for Primary Industries Working Group, (2019)
https://www.mpi.govt.nz/dmsdocument/37751-food-fibre-skills-action-plan-webv2-pdf

The Food & Fibre Youth Network- He Tātai Rangahua
The Food & Fibre Youth Network- He Tātai Rangahua, (October 2021)
https://www.ffyouthnetwork.co.nz/

National Agricultural Workforce Strategy Learning to Excel
National Agricultural Labour Advisory Committee, (December 2020)
https://www.awe.gov.au/sites/default/files/documents/national-agricultural-workforce-strategy.pdf

Inquiry into the future of the workforce needs in the Primary Industries of New Zealand
Primary Production Committee, (28 October 2021)
https://www.parliament.nz/en/pb/sc/make-a-submission/document/53SCP
P_SCF_INQ_109465/inquiry-into-the-future-of-the-workforce-needs-in-the-primary

MPI Submission to the Primary Production Select Committee Inquiry into the Future Workforce Needs of New Zealand's Food and Fibre Sector
Ministry for Primary Industries, (May 2021)
https://www.parliament.nz/en/pb/sc/make-a-submission/document/53SCPP_SCF_INQ_109465/inquiry-into-the-future-of-the-workforce-needs-in-the-primary

Needs and Skills Survey
New Zealand Apples & Pears

Forest Management Plan 2014-2023
Queensland Government and Agencies, (December 2013)
https://www.dpaw.wa.gov.au/images/documents/conservation-management/forests/FMP/20130282_WEB_FOREST_MGT_PLAN_WEB.pdf

Commitment 5 Issues Paper
Dairy tomorrow, (28th July 2021)
https://www.dairytomorrow.co.nz/

Dairy tomorrow: The Future of New Zealand Dairying (The Dairy Industry Strategy 2017-2025)
Dairy Tomorrow, (2017)
https://www.dairytomorrow.co.nz/wp-content/uploads/2017/12/dairy-strategy-2017-A4-booklet-Part3.pdf

The View from the Cow Shed
Dairy NZ, Pre election Briefing. (2020)
https://www.dairynz.co.nz/media/5793525/the_view_from_the_cow_shed_18_aug_2020.pdf

USDA Resource Guide for Rural Workforce Development
US Department of Agriculture, (2021)
https://www.rd.usda.gov/sites/default/files/060721-ic-ruralworkforceguide-final508.pdf

Forestry and Wood Processing Workforce Action Plan 2020-2024
Ministry for Primary Industries Working Group. (2019-2020_
https://www.mpi.govt.nz/dmsdocument/40366-Forestry-Wood-Processing-Workforce-Action-Plan-20202024

Workforce Development in Aquaculture and Fisheries
Blue Earth Consultants
https://blueearthconsultants.com/wp-content/uploads/2020/08/pub37FINAL_Public_Report_Builders_Initiative_Landscape_Analysis_032620.pdf

Marine Aquaculture Workforce Development Strategy
Gulf of Maine Research Institute, The Maine Aquaculture Association, Education Maine, FocusMaine, (May 2020)
https://gmri-org-production.s3.amazonaws.com/documents/Maine_AWDS_evidence_report_summary.pdf

Agri-Food Industry Workforce Skills and Development Strategy
JD Swadling, (June 2018)
https://projectblue.blob.core.windows.net/media/Default/What%20we%20do/Skills%20and%20training/Skills%20Strategy%20Full.pdf

He kai kei aku ringa, The Crown-Māori Economic Growth Partnership
Māori Economic Development Panel, (November 2012)
https://www.tpk.govt.nz/en/a-matou-mohiotanga/business-and-economics/he-kai-kei-aku-ringa-the-crownmaori-economic-growt

Aboriginal Workforce Strategy 2021-2026
Department of Health and Department of Families, Fairness and Housing (September 2021)
https://www.dffh.vic.gov.au/publications/aboriginal-workforce-strategy-2021-2026

Strong Voices, Strong Communities (Workforce Development Action Plan 2019-2024)
First Nations Media, Belinda Clark, (June 2019)
https://firstnationsmedia.org.au/projects/workforce-development-action-plan-2019-2024

Tribal Workforce Development: A Decision-Framing Toolkit
National Congress of American Indians
https://www.ncai.org/resources/ncai_publications/tribal-workforce-development-a-decision-framing-toolkit

BC First Nations Forest Strategy
B.C. First Nations Forestry Council, (May 2019)
https://www.forestrycouncil.ca/cpages/forest-strategy-public

A British Columbia First Nations Forestry Workforce Strategy
B.C. First Nations Forestry Council, (17th August 2018)
https://www.forestrycouncil.ca/cpages/workforce-strategy

Atlantic Indigenous Labour Market Initiative: Preparing Today's Youth for Future Employment
The Atlantic Aboriginal Economic Development Integrated Research Program, (March 2019)
https://www.apcfnc.ca/wp-content/uploads/2020/06/FINAL_Report_-_AILMI__June_2019.pdf

Inclusive Futures: Indigenous Engagement in Canada's Workforce
Action Canada
https://ppforum.ca/wp-content/uploads/2020/03/AC-Inclusive-Futures-Indigenous-ENG-WEB.pdf

For more information, contact

Jeremy Baker	Chief Executive Muka Tangata
Mitzi Austin	General Manager, Engagement and Partnerships, Muka Tangata
Melissa Clark-Reynolds	FutureCentre.nz @HoneyBeeGeek melissa@futurecentre.nz

MELISSA CLARK-REYNOLDS, ONZM trained with the Institute for the Future in Palo Alto after an almost 30-year career in Technology. She has continued to develop her knowledge, training with reknowned futurist Sohail Inayutollah and others. Her academic background includes a BA Hons in Anthropology and Masters study in Environmental Health. This combination of pattern recognition as a social scientist and in advanced maths and science is her superpower. She has been designing and leading technical training for over 20 years, and is an in-demand public speaker too. She founded FutureCentre,nz and focuses primarily on the AgriFood sector. Her LinkedIn Profile is here: https://www.linkedin.com/in/melissaclarkr/

KIRIWAITINGI REI is of Te Arawa and Ngati Awa descent and is the CEO of Maori Investments Limited, an asset holding company in the eastern Bay of Plenty that has an asset portfolio that includes forestry, several kiwifruit orchards, and a retail blueberry business. Her career has included management roles in a Treaty post-settlement entity and prior to that, as a solicitor and in-house counsel. Kiriwaitingi holds a number of governance roles including Deputy Chair of the Maori Kiwifruit Growers Forum, Chair of Putauaki Trust, Ngati Awa Group Holdings Limited and the Bay of Plenty Rugby Union. She was also a Future Director of Auckland International Airport. Her LinkedIn Profile is here https://www.linkedin.com/in/kiriwaitingi-a-rei-b3529a5a/?originalSubdomain=nz

JUDITH EASTGATE has worked on a number of projects with FutureCentre.nz over the last 4 years. She is an expert in listening and leads a number of training programmes in effective communication. has worked with people for over 25 years in both the public and private sector in the Asia Pacific region. She is committed to impacting the future of NZ through working with leaders in our organisations. In 2014 Judith trained at 'Being a Leader and the Effective Exercise of Leadership' delivered by EJI in the US. She has contributed to a range of FutureCentre.nz projects, including interviewing Ministers, Iwi partners and interested parties for a number of organisations, including Napier Port, AsureQuality and Te Papa Atawhai/DoC. Her LinkedIn Profile is here: https://www.linkedin.com/in/juditheastgate/

MEG MELVIN is a visual storyteller. She has worked with FutureCentre on dozens of projects, including for the Ministry of Housing and Urban Development, The Port of Napier and on the NZIOD's Disruptive Innovation course. Her LinkedIn profile is here: https://www.linkedin.com/in/megmelvin/?originalSubdomain=nz

GRACE CLARK recently completed a MA in Creative Writing, Editing and Publishing at the University of Melbourne. She is key to the writing, editing and designing of FutureCentre work. She also helps supporting the room during live events – looking after participants and managing their needs. She has worked closely with projects for Weta, Napier Port, AsureQuality and the Global Signals Newsletter. She is also an experienced Social Media Manager.

MORGAN BOLE is the Analyst for FutureCentre. She holds a MA in Strategic Studies from the Australian National University. Morgan provides Foresight, Insight and Competitive Analysis research for a number of our clients, including Kotahi, PaymentsNZ, and Flux Federation. Morgan is a contributor to the Global Signals Newsletter produced by Callaghan Innovation and helps to deliver Callaghan's Global Signals workshops for the AgriTech ITP.

MUKA TANGATA
People, Food and Fibre
Workforce Development Council