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THE FUTURE OF NEW ZEALAND FOOD SYSTEM:

What do stakeholders need to know to inform their decisions today?

Report on the outcome of two workshops run as part of the Kai Anamata mō Aotearoa: Exploring future food system scenarios and impacts Research Programme

Kai Anamata mō Aotearoa
Future Food New Zealand

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Table of Contents

Background

The Aotearoa New Zealand (NZ) food system faces many challenges. Our food production has a significant environmental footprint, poor food consumption patterns are having a negative impact on population health, and external shocks to our food system are increasing in frequency and severity, demonstrated by Cyclone Gabriel, droughts, and supply chain disruption. Individuals, organisations, and government are under increasing pressure to make big decisions affecting the future of the Aotearoa-NZ food system.

To make necessary changes, the implications of change on our food system must be understood across the value-chain. But translating the breadth of food system science to those who enact changes is challenging. The scope of the food system –touching Mātauranga Māori and hundreds of years of traditional knowledge, agriculture, trade, economics, technology and innovation, the natural environment, and human nutrition and wellbeing – makes a holistic view of outcomes challenging to gauge without a clear model of how the system works.

The Kai Anamata mō Aotearoa: Exploring future food system scenarios and impacts Research programme (KAMA) will produce the first national computational model of Aotearoa-NZ's food system capturing environmental, economic, social, and cultural aspects of wellbeing at national and regional levels

This multi-organisation collaboration will extend existing work with the incorporation of new data, new measures, and an interface accessible to anyone with an interest in the future of the Aotearoa-NZ food system, to ensure that the breadth of consequences of any future change is fully visible to all. This will be underpinned by field trials and novel data collection in Te Tauihu – the top of the South Island – to support modelling and provide a case study for scalability of new and/or indigenous species, leading to a regional strategy that can be replicated nationally.

Workshops

This report summarises insights from two KAMA workshops, where stakeholders explored challenges, scenarios, and measures for improving **Aotearoa's food system.**

In July 2024, the KAMA team ran two workshops: one in Wellington and one in Auckland. We invited representatives from central and local government, food sector industry and industry-adjacent bodies, food charities, environmental groups, crown research institutes and universities. The intention was to gather a broad representation of food system stakeholders who are likely to engage with the model in the future to understand their needs and ensure we build the relevant capability and research into the model and wider programme from the outset.

Through facilitated table discussion sessions and electronic feedback, attendees were asked about their thoughts on the challenges facing the Aotearoa-NZ food system, what scenarios they would investigate if they had a perfect replica of the food system to play around with, and what outcomes and measures they find important for understanding the food system and whether it is changing in a positive direction. We then ran a follow-up survey with workshop attendees in February 2025 to capture additional information.

This report summarises the outputs of the two workshops and the survey, based on analysis[1] of notes written by table facilitators, electronically submitted responses from attendees, and quantitative analysis of electronic polls. It represents an attempt to summarise the content of the discussion rather than set an agenda and should not be seen as the opinion of the KAMA team or of any individual present at the workshops.

[1] The analysis takes the form of a topical survey (as classified by Sandelowski and Barroso (2003) Classifying the Findings in Qualitative Studies), but with methodology guided by Kiger and Varpio (2020) Thematic analysis of qualitative data: AMEE Guide No. 131.

Challenges

The first discussion session at each workshop asked attendees what they felt were the biggest challenges facing the **Aotearoa-NZ food system over the next 10 to 20 years.** Key cross-cutting themes that emerged from the responses were:

Environmental challenges

Both the impact of food production on the environment and the impact of environmental change on food production

Social & labour market challenges

Human health related to food consumption and human capital challenges

Export & supply chain challenges

Supply chain and export vulnerability as a geographically isolated yet trade dependent nation

Systemic issues & cross-cutting challenges

Systemic issues around a lack of strategic food system vision, priorities, and leadership and challenges with our ability to change the current system

Environmental challenges

Climate change and water issues were the most commonly raised challenges. Climate change will impact the food production system both directly, requiring adaptation or shifts to current production, as well as indirectly through the requirement to reduce carbon emissions and increase carbon sequestration throughout the food system. Domestically, changes to temperature profiles and increased frequency of severe weather events were seen as highly disruptive to food production, and our ability to adapt, future-proof, and recover was questioned.

The changing climate will alter the suitability of parts of the country for various land uses, rendering existing production difficult or impossible in some places, but also potentially opening new opportunities. The impact of climate change on biosecurity was also raised: new or increased pest and disease risks for both plants and animals appear likely. The role of climate change in reducing water availability for food production was also discussed, with a need for better water infrastructure in at-risks regions required. Climate change impacts overseas are also relevant. What can be grown elsewhere in the world will change, which may have implications for demand for Aotearoa-NZ products.

The environmental impact of the current food system was identified as a significant challenge. Water quality, ownership and accessibility were seen as particularly important points, with a general acknowledgement that managing water was one of the key systemic challenges faced by the food system of Aotearoa. Biodiversity, soil health, and waste disposal were also specifically mentioned, and it was generally felt that planetary boundaries were being exceeded. Links were made here to food consumption: there is currently little connection between diets and environmental impact, with the lack of linkage between the cost of diets and the cost of environmental impact specifically highlighted.

SOCIAL & LABOUR MARKET CHALLENGES

The second most discussed challenge was the contribution of poor access to high quality food domestically to population health. The main cause identified was affordability challenges – the price of healthy food is high relative to incomes – with some mention of food access difficulties also. The role of supermarkets in this was often raised as highly important, particularly with reference to the impact of the existing duopoly on competition and access. Nutrition education and thus knowledge in the population was seen as poor. The cumulative result of these challenges is poor population health, poor productivity, and lower overall wellbeing of New Zealanders extending intergenerationally.

Inequities in access to high quality food was also recognised as a challenge, exacerbated by changing levels of nutrition in our food over time, poor genetic diversity in the crops contributing a large proportion of our diets, and deleterious changes to food preferences. The food production workforce in Aotearoa-NZ was mentioned often. There was the opinion that (particularly young) New Zealanders increasingly do not want to farm, as there is a poor perception of working in agriculture. Linked to this is the issue of a food production system dependent on low productivity employment that is unable to pay wages sufficient to attract domestic workers.

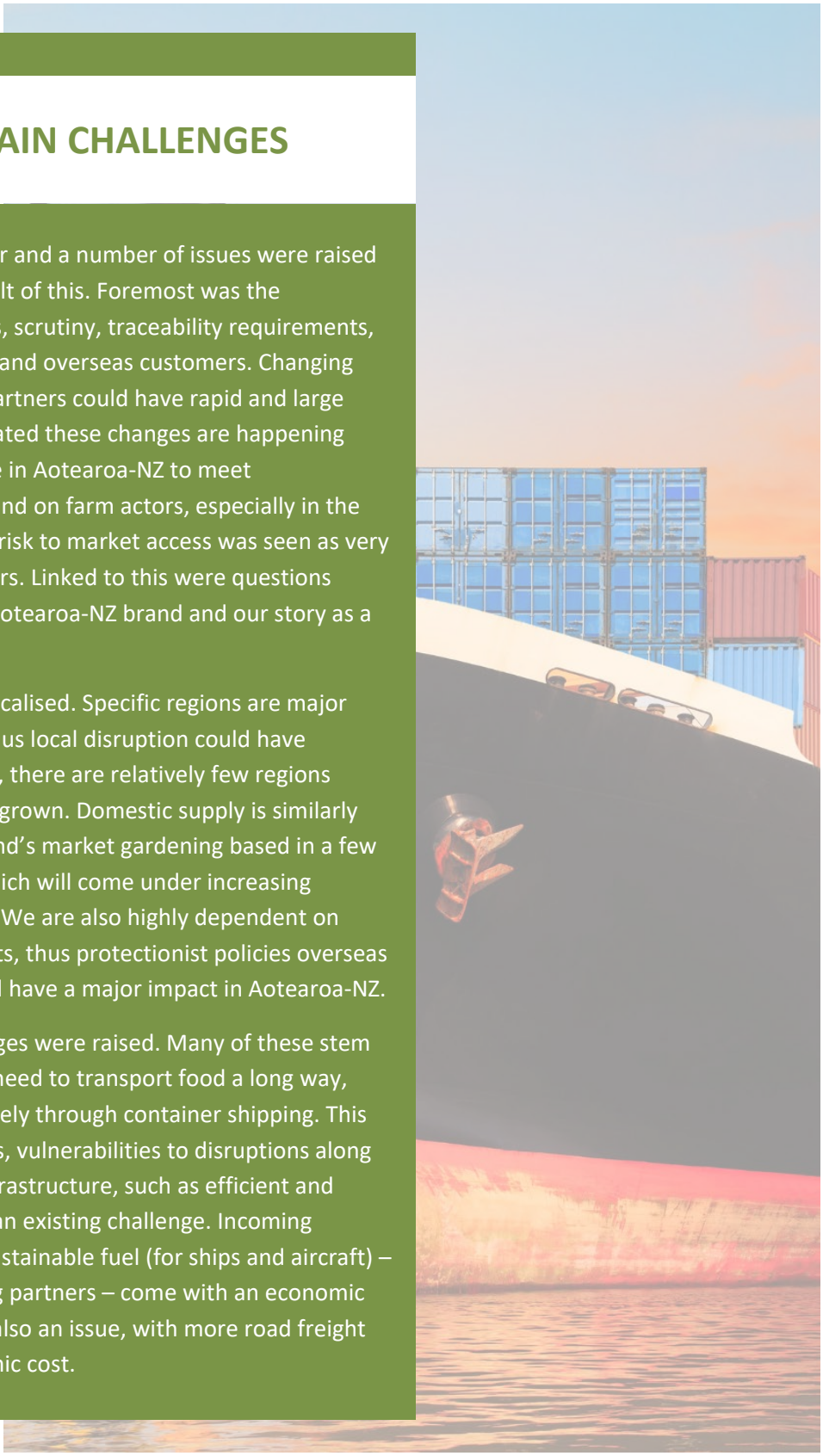
Separately, there were questions about what the impact of a major change to food production patterns in New Zealand would be on feelings of identity in agricultural communities and the relevance of existing skills in the current workforce. Social license was also cited as a challenge, particularly the acceptability of current food production practice to the overall Aotearoa-NZ population, but also that of any future food system change. This linked to other mentions of trust and reputation, within and beyond Aotearoa-NZ, and the public perception of and engagement with agriculture.

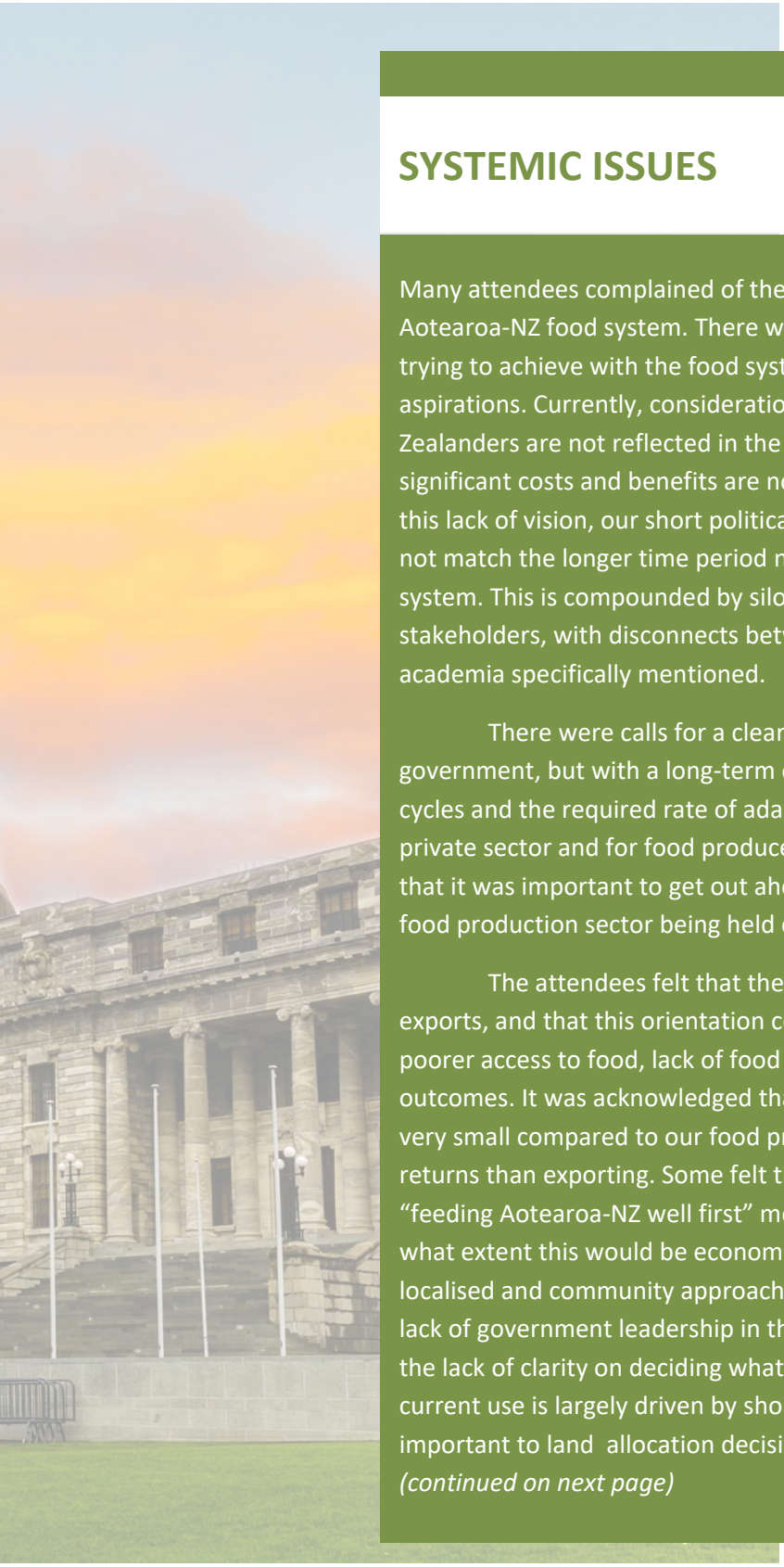
EXPORT & SUPPLY CHAIN CHALLENGES

Aotearoa-NZ is a major food exporter and a number of issues were raised relating to our vulnerability as a result of this. Foremost was the accelerating increase in expectations, scrutiny, traceability requirements, and regulations from trade partners and overseas customers. Changing signals or expectations from trade partners could have rapid and large effects on food production. Many stated these changes are happening faster than the change required here in Aotearoa-NZ to meet expectations, both from regulatory and on farm actors, especially in the environmental space. The emerging risk to market access was seen as very real and near – within the next 5 years. Linked to this were questions around the public credibility of the Aotearoa-NZ brand and our story as a "clean green" food producer.

Export vulnerability is also localised. Specific regions are major contributors to specific industries, thus local disruption could have national consequences. For example, there are relatively few regions where root vegetables are currently grown. Domestic supply is similarly vulnerable, with much of New Zealand's market gardening based in a few relatively concentrated localities, which will come under increasing pressure with a growing population. We are also highly dependent on specific trade partners for our exports, thus protectionist policies overseas or disruption in these markets would have a major impact in Aotearoa-NZ.

Several supply chain challenges were raised. Many of these stem from the "tyranny of distance": our need to transport food a long way, whether importing or exporting, largely through container shipping. This incurs high costs, long shipping times, vulnerabilities to disruptions along the way, and requires substantial infrastructure, such as efficient and appropriately sized, located ports – an existing challenge. Incoming regulations on green shipping and sustainable fuel (for ships and aircraft) – largely externally imposed by trading partners – come with an economic cost. Our internal supply chains are also an issue, with more road freight than desirable, and at a high economic cost.





SYSTEMIC ISSUES

Many attendees complained of the lack of a strategic, long-term vision for the Aotearoa-NZ food system. There were calls for agreement on what we are trying to achieve with the food system to understand our priorities and aspirations. Currently, considerations important to the wellbeing of New Zealanders are not reflected in the main drivers of the food system as significant costs and benefits are not captured by market prices. In addressing this lack of vision, our short political cycles (and thus short policy longevity) do not match the longer time period needed for real transitions in the food system. This is compounded by siloing and disconnections between stakeholders, with disconnects between industries, and between industry and academia specifically mentioned.

There were calls for a clear strategy and lead, probably from government, but with a long-term outlook. This disconnect between planning cycles and the required rate of adaptation was also identified as an issue for the private sector and for food producers themselves. There was a strong sense that it was important to get out ahead of key upcoming challenges to avoid the food production sector being held captive by stranded assets.

The attendees felt that the focus and priority of our food system is exports, and that this orientation comes with many domestic costs, such as poorer access to food, lack of food security, and worsening environmental outcomes. It was acknowledged that the domestic market in Aotearoa-NZ is very small compared to our food production capacity and often offers lower returns than exporting. Some felt that action was needed to move towards a "feeding Aotearoa-NZ well first" mentality, but there were questions around to what extent this would be economically feasible. Discussion of the role of localised and community approaches emerged, and there were mentions of a lack of government leadership in this space. This challenge was not helped by the lack of clarity on deciding what the best use of any parcel of land is. The current use is largely driven by short term market returns, but many factors important to land allocation decisions were mentioned that are not

(continued on next page)

well reflected in current decision making: nutrition, minimising environmental damage, and preventing expansion of housing onto good food production land as the national population grows.

Overcoming the status quo was seen as a challenge. This applies at both ends of the food system: what we produce and what we eat. Most of the advice and thinking available in the country is grounded in current practice, limiting change. The current system, specifically industry levies; regulatory and planning systems; the lack of subsidies; the power, capital, and infrastructure sitting in existing large industries; and the lower profitability, access to capital, and access to land of alternative land uses, does not incentivise change towards a more sustainable system and makes it difficult for small industries to grow.

CROSS-CUTTING CHALLENGES

In assessing the current and potential future systems, attendees noted the current lack of good metrics for all aspects of the system to tell us if we are moving in the right direction. Lack of measurement means a lack of evidence to support change, and translating overseas numbers or approaches will not always be applicable in the Aotearoa-NZ situation. In particular, there was a clear consensus about the need to capture the non-market impacts of the food system not reflected in market prices.

The complexity of the food system is itself a challenge: both its many parts, interacting in non-linear, unpredictable ways, and also how these move over time to understand long term effects. Planning system change therefore takes time, but action is already needed, requiring us to work faster. How do we incorporate longer term thinking into our planning under such complexity? How do you change the system effectively, especially in the presence of siloed stakeholders? The relationship between the global and national food systems must be present here, as well as acknowledgement that national level solutions and local solutions are needed, depending on the challenge faced.

WHAT DOES THIS MEAN FOR KAMA?

The team were encouraged to see the challenges of food system complexity and a lack of system-wide metrics raised, as these are challenges that the existence of the model will directly address. The discussion around timeframes was highly useful: initially the model would deal with "snapshots" of the future, but this discussion clearly demonstrates the need for a view of transition time and transition cost.

The emphasis on the environmental impacts of the food system – particularly on water – and the role of climate change were anticipated. Fortunately, the established focus on these issues has resulted in a foundation of existing work (e.g. Our Land and Water National Science Challenge), which will be readily transferrable into the model.

The focus on supply chain challenges prompted good team discussion. Infrastructure requirements should be readily integrated into the model, but capturing their resilience is an ongoing discussion. Modelling nutrient flows from production to consumption was of significant interest but will be challenging given that many of the drivers of population nutrition lie outside the scope of KAMA modelling. Certainly, the nutritional value of food produced and traded can be captured in the model, but food access, food security, and health outcomes are strongly driven by behavioural, microeconomic, and social factors beyond the scope of the model.

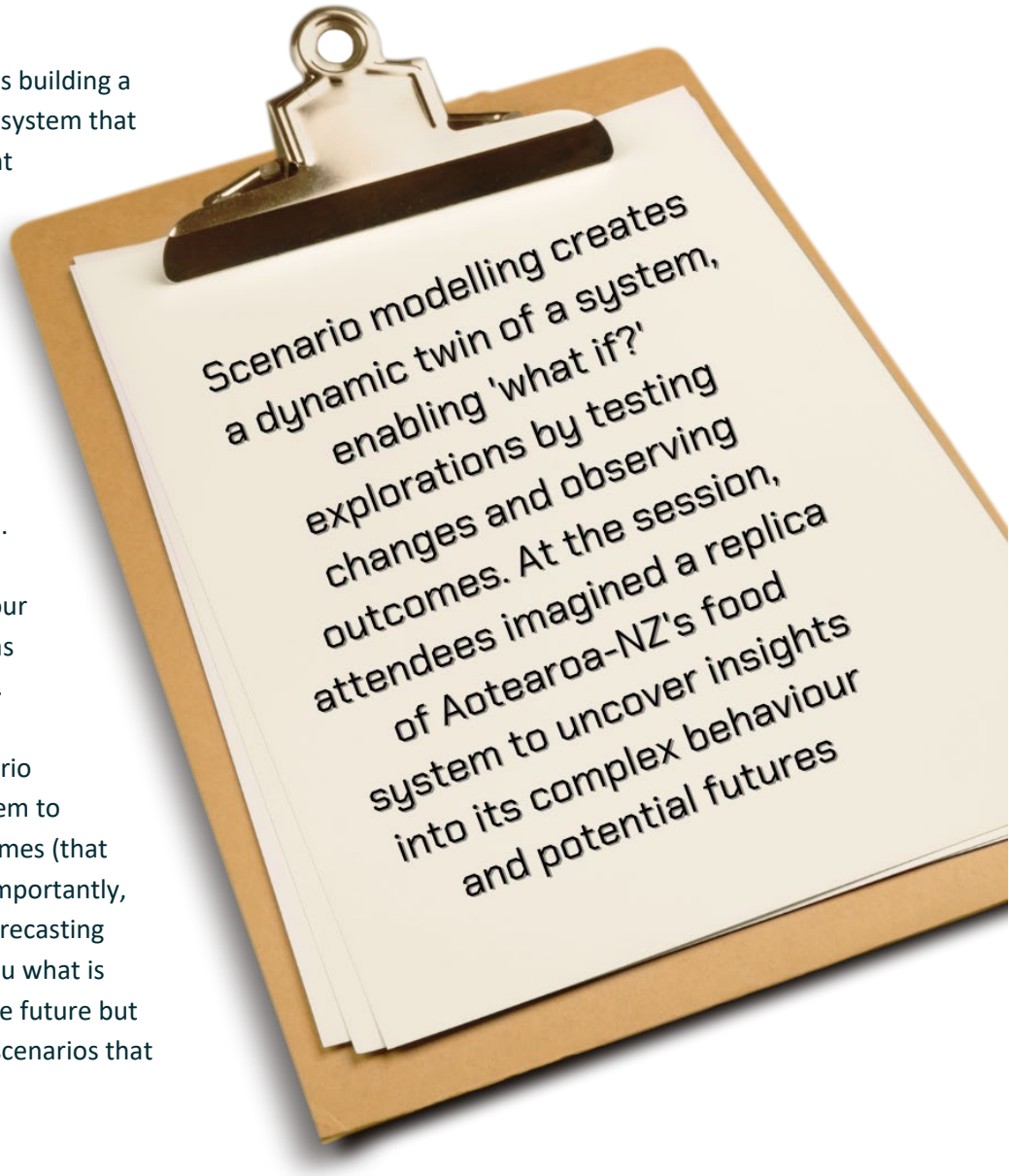
Calls for a strategic vision, or specifically for a National Food Strategy, have been widely made over the last several years, and were echoed here. The role of the model here would be to provide an evidence base to support the development of such a strategy, testing the outcomes of various future changes.

The complexity of the food system is itself a challenge: both its many parts, interacting in non-linear, unpredictable ways, and also how these move over time to understand long term effects. Planning system change, therefore, takes time, but action is already needed, requiring us to work faster. How do we incorporate longer term thinking into our planning under such complexity? How do you change the system effectively, especially in the presence of siloed stakeholders? The relationship between the global and national food systems must be present here, as well as acknowledgement that national level solutions and local solutions are needed, depending on the challenge faced.

Future Scenarios

At the outset of the second session, the attendees were given an overview of **scenario-based modelling**, as this is the approach that the KAMA team are taking in building this model.

Scenario modelling involves building a computational replica of a system that captures its most important dynamics. Once it is a reliable replica, the model can be challenged with various scenarios. This involves changing some aspect of the model system, and seeing what happens to the other parts. It can be useful for better understanding the behaviour of complex systems and has many existing applications. Fundamentally, scenario modelling requires a scenario (something about the system to change) and a set of outcomes (that respond to that change). Importantly, scenario models are not forecasting models: they do not tell you what is most likely to happen in the future but rely on you to investigate scenarios that may happen.



Scenario priorities

The most commonly raised scenarios all related to some change in current land use or production. For example, there were attendees interested in land use diversification (both in terms of products produced and the number of locations producing them); replacing dairy with precision fermentation; changing cattle breeds for a different meat quality; producing white meat domestically rather than importing; or replacing wine country with food farms. There were also scenarios where current production of certain foods (especially fresh vegetables) was relocated, as a result of urban expansion or climate change. Urban expansion itself was a topic of conversation, particularly the displacement of good agricultural land for housing. Related to some of the challenge discussion, attendees were also interested in the consequences of shifting land use to its best use, however that was quantified, or of adopting better management practice, with regenerative agriculture mentioned. Conversely, there was also suggestion of modelling business-as-usual scenarios into the future, to understand the impact of no substantial change.

The idea of localising food systems was also widely discussed in various forms. This included more localised food processing hubs, creation of direct markets between consumers and producers, regulating for more mixed production systems, and the idea of meeting all national (or even regional) food needs with local production before considering export. Also popular were scenarios testing the impact of specific policy changes (regulatory, trade, and property) on the system as a whole. Fewer specific use cases were given here, but there was general support for the idea of being able to comprehensively test the consequences of both radical and moderate policy changes. One specific suggestion was testing the impact of producing for local consumption rather than export, which would have similar characteristics on the production side but would generate different economic returns to the producer.

Several scenarios raised directly related to climate futures, including modelling the impact of sea level rise, severe weather events, and the broader impact of various emissions reduction futures. Other environmentally-driven scenarios included changing production patterns or using new technology to reduce pollutants to within set limits. Wetland and biodiversity restoration were also raised, as well as adding buffer zones around ecologically sensitive areas. There was some discussion of minimising and/or redirecting food waste, including halving food waste in line with international targets. Bridging economics, environment, and policy change, scenarios introducing biodiversity credits were proposed, including farming in the emissions trading scheme. Incorporating the true cost of all food externalities into food prices for the consumer was also posed. Lastly, financially incentivising less economically attractive but more sustainable production systems was a scenario of

interest. From a consumer perspective, several attendees raised ideas such as better education on food and nutrition, as well as reducing sugary foods and fast food access, advertising, and imports.

The time dimension was discussed again in this session. Attendees were interested in looking both at scenarios where system change was gradual, but also those where change was in the form of a shock.

WHAT DOES THIS MEAN FOR KAMA?

The modelling team were largely reassured that much of what was discussed was either originally planned or a natural extension of current model development. Changes in land use are absolutely within scope of the model. In fact, the model's development has begun with land use, before building in food flows beyond the farm gate. Thus, the scenarios for land use change, diversification, and localisation will all be possible to investigate with the model. Similarly, it is our intention that the model be useful in understanding climate resilience, thus modelling weather events and changes to land suitability due to climate will be possible.

The ability of the model to capture policy change depends on the nature of the policy and the outcome of interest. For example, the model could certainly test the implications of changes to land use policy, but not to changes in fast food advertising policy. Similarly, it would be possible to use the model to see which areas of land would need to change their use under a certain policy, but would not forecast land owner behaviour to predict the resulting pattern of land use. As per the challenges discussion, consumer-targeted change would be more difficult to model, as much of the resulting real change would be the result of consumer behaviour, which is beyond model scope. Importantly, this means that KAMA will not be able to meaningfully assess scenarios relating to consumer nutrition.

As also raised in the challenges section, the time dimension of the model is being actively discussed; following this input, we aim for the model to be useful for seeing both, point-in-time and transition outcomes.

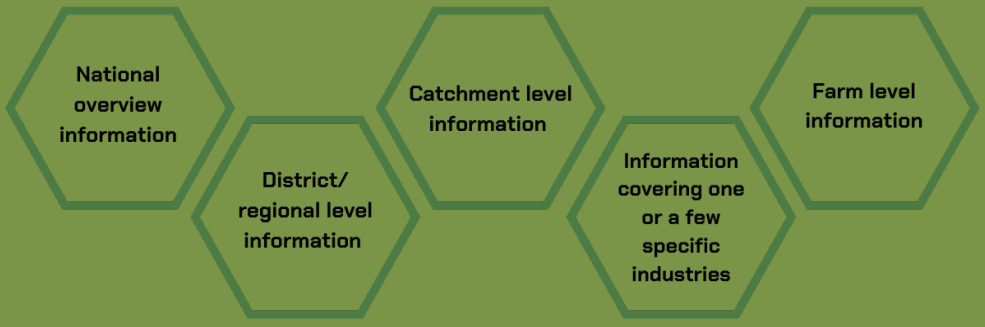
Outcomes and measures

Following the discussion of scenarios of interest, attendees were asked what they would look at as outcomes of interest in these scenarios, and how they would measure whether an outcome had improved or worsened. As part of this exercise, they were given a list of 30 measures that were already under consideration by the research team and asked to rank their importance for supporting decisions in their own work. These measures spanned environmental, economic, and human outcomes – the full list and full results can be seen in the appendix.

QUANTITATIVE RESULTS

The environmental measures greenhouse gas emissions, water quality, soil erosion, and carbon sequestered were four of the top five ranked measures. The third highest ranked measure was nutritional content of food produced. Following these, employee wellbeing, workforce health outcomes, and biodiversity all appeared above the first appearance of a monetary measure: total economic return to enterprise. The majority of measures received mixed ratings for importance across the attendees, reflecting the diversity of views in the rooms. Only emissions, water quality, carbon sequestered, and biodiversity were given high ratings by all attendees – all environmental measures.

Attendees were also asked to rank the importance of having the following when it came to the previously ranked outcome measures:



National overview information received the highest overall ranking, but there was little separating the rankings for each of these options.

Outcomes and measures raised by attendees

Attendees were then asked more broadly about what outcomes they would be interested in checking in their scenarios and what measures (in addition to those already ranked) they would rely on to know whether change was in a positive direction.

By far the most widely discussed outcomes were related to food access and affordability, food security, nutrition, and nutritional health. However, it was not always clear to attendees how these factors should best be measured. Many attendees mentioned population diet, or sufficient availability or intakes of nutrients or food groups, or resilience of local food supply. Attendees thought it would be useful to know the "local-ness" of food supply in New Zealanders' diets: within the region, nationally, or imported. There were also many mentions of retail cost to the consumer (particularly if externalities were included in retail prices), and of degree of reliance on food banks, particularly vulnerable groups. On the health aspect, chronic disease rates, hospitalisations, and the cost of health care were raised as useful measures.

Employment and the workforce was another strong area of discussion. Job security, diversity, and quality in the food sector, career pathways, farmer capability, seasonality of work, and the number of foreign workers were all mentioned. Related measures included labour units, unemployment, wages (median and distribution), household incomes, and workforce skills. A great diversity of less tangible social outcomes were also discussed. Equity was a theme across various other outcomes: equity of food access, equity of measurement, equity of wealth and incomes, and equitable value chains. Identity, belonging, and connection were mentioned by several groups: both connection to the land and connection between consumers and producers. Public perception of agriculture under future land use scenarios was also an outcome of interest, but no clear method for measuring this was articulated.

Many attendees cited human wellbeing as an outcome or measure they were very interested in, and that this would be a real addition above what was currently widely available. Related measures included standard of living and workplace wellbeing. Several outcomes mentioned by attendees related to indigenous aspects of the food system. These include the extent of Mahinga Kai practice, degree of iwi and hapū leadership in the system, Māori rights, interests, and food sovereignty. Culture and the status of Taonga species were also mentioned. Environmentally, the pollution caused by the food system was widely discussed, with impact on Te Taiao often recorded in workshop notes. The planetary boundaries were widely cited as an intuitive way of visualising and understanding the acceptability of environmental impact. Greenhouse gas emissions and water quality emerged as the main outcomes of interest. Emission measures naturally total emissions, but also

carbon efficiency (per unit produced or per nutritional value), product footprints, transport emissions, climate change mitigation, carbon sequestration, and progress towards net zero emissions. Food waste, biodiversity, soil health, deforestation, and healthy oceans were all also raised as outcomes of interest, as was linking environmental outcomes to economic value via true cost accounting.

Resilience was a cross-cutting theme featuring in many discussions. Production and supply chain resilience in the face of shocks (particularly weather events) was the most discussed, but also the resilience of producers themselves and their communities. Economically, there was interest in the cost of producing and transporting food, including the cost of land, debt servicing, and the cost of agricultural inputs and equipment required, which drove towards discussion of cost effectiveness. Profitability, economic return to the producer, sector or Aotearoa-NZ, but also true profitability (accounting for the cost of externalities) were measures of choice for many attendees. Infrastructure and technology requirements to support a changed food system of the future were discussed, as well as their costs.

Related to exports, attendees were interested in the quantity of exported product, as well as the demand for it. Export intensity was highlighted as a useful measure, as well as the more conventional GDP at both, regional and national levels.

WHAT DOES THIS MEAN FOR KAMA?

The discussion of outcomes and measures will provide ongoing discussion throughout model building. Our approach will be to include any outcome or measure in the model for which there is demand from stakeholders, data availability is sufficient, and which fits within the model scope. We also intend to provide a confidence rating on model outputs, so that users can see the difference between a value calculated from high quality data with high confidence (e.g. labour units required in an existing industry) and a value estimated from sparser data with lower confidence (e.g. future average wage in an emerging industry).

As mentioned earlier, modelling food access, food security, and health outcomes becomes increasingly difficult. Thus, it may be that the model will stop at food production and trade with inference on the impact of this on population nutrition lying outside the scope of the model. The employment, economic, and environmental measures raised by attendees mostly sit within existing data availability and can therefore be included. Data gaps or lack of standardisation will be a challenge for some of the emerging environmental measures, such as soil health and biodiversity, but may be tackled as part of the programme's data collection strand.

Next steps

The KAMA team will continue the development of the model and field work having integrated the feedback provided by stakeholders in these two workshops. Those attendees who expressed an interest in remaining involved with the program will be regularly consulted on relevant questions and be the first to test early versions of the model to gather feedback.

If you wish to express an interest in being a part of this stakeholder group, please contact: info@sustainablenutritioninitiative.com

ACKNOWLEDGEMENTS

The research team would like to thank the many workshop attendees and their respective organisations who contributed their time to these workshops. Their input has already and will continue to shape the work of the programme.

The Kai Anamata mō Aotearoa: Exploring future food system scenarios and impacts Endeavour Research Programme is funded by the New Zealand Ministry of Business, Innovation and Employment (Contract MAUX2305).

Appendix

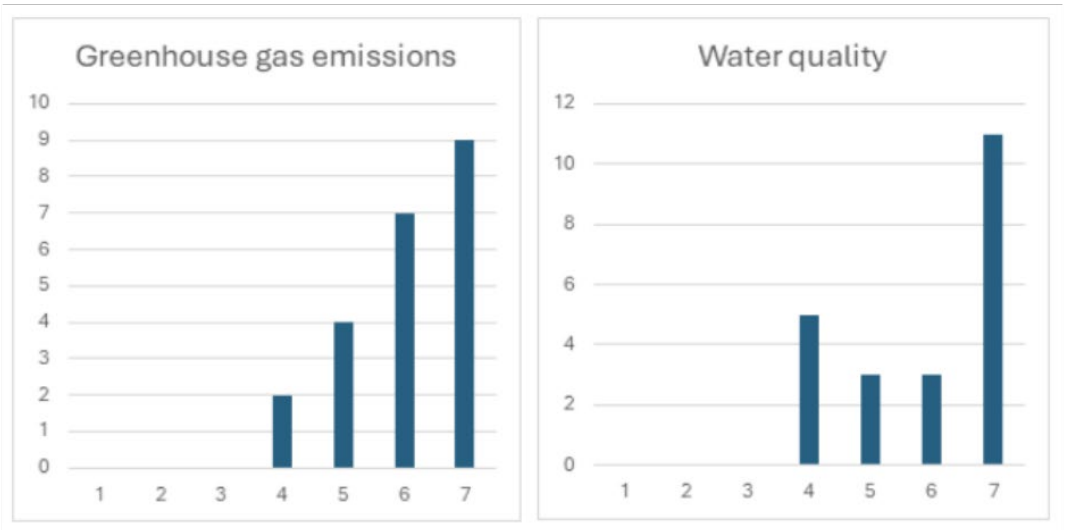
The workshops were held in Wellington (17th July 2024) and Auckland (25th July 2024). The KAMA team invited over 200 representatives of national and local government, academia, food and fibre sector industry, agricultural finance, non-government organisations and charities, and independent thought leaders in the food system. Twenty-five attended across the two workshops, including representatives from the Ministries for Primary Industries and for the Environment, local government, the major food sector industries, several universities and crown research institutes.

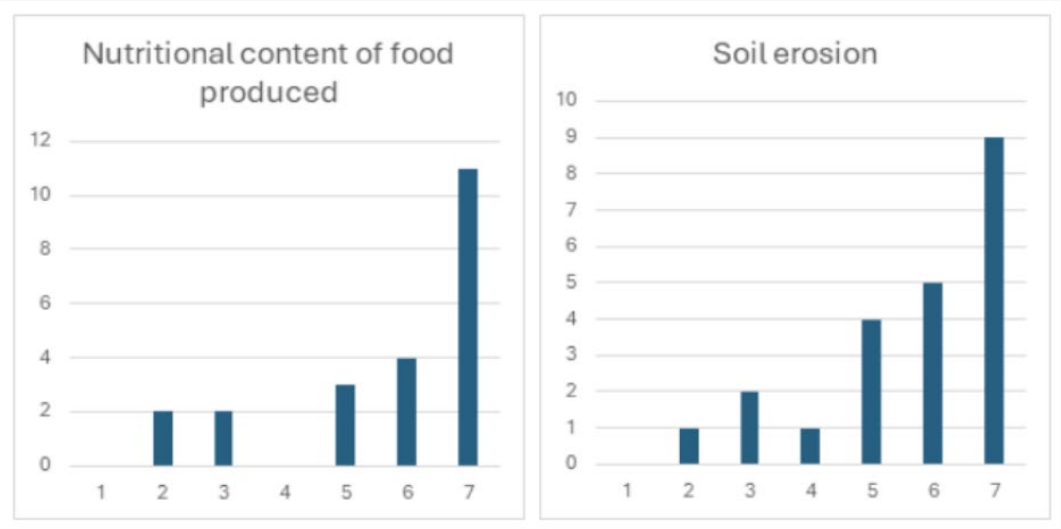
The full list of measures provided during the ranking exercise is as follows, ordered by mean ranking across the two workshops. Participants were asked to rank these outcomes for their importance in their work decisions, on a scale from 1 “this is never important in my decisions” to 7 “I always consider this in my decisions”.

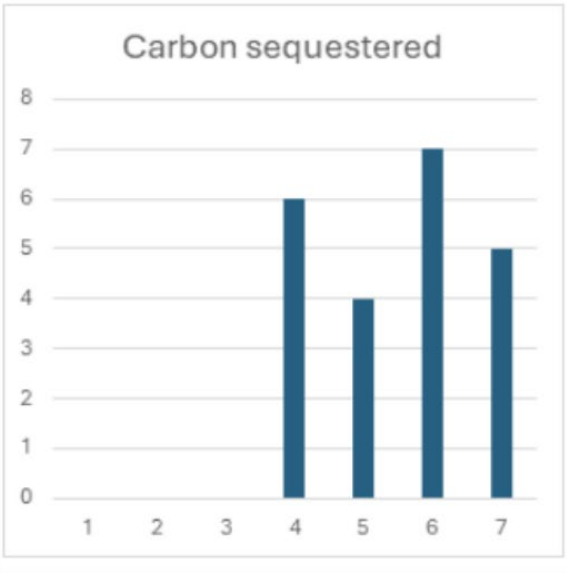
Outcome	**Mean ranking**	**Count of attendees giving ranking of 6 or 7**	**Median ranking**
Greenhouse gas emissions	6.05	16	6
Water quality	5.91	14	6.5
Nutritional content of food produced	5.73	15	6.5
Soil erosion	5.68	14	6
Carbon sequestered	5.50	12	6
Employee wellbeing	5.36	12	6
Workforce health outcomes	5.36	12	6
Biodiversity	5.32	11	5.5
Total economic return to enterprise	5.18	12	6
Energy use	5.14	8	5
Operational costs	5.14	10	5
Export value of products produced	5.09	10	5
Capital investment for land use change	4.95	9	5

Outcome	Mean ranking	Count of attendees giving ranking of 6 or 7	Median ranking
Workforce skills and qualifications	4.95	12	6
Total irrigation water used	4.86	8	4.5
Total fertiliser use	4.82	7	4.5
Profit per hectare	4.73	9	5
Government subsidy expenditure	4.55	8	5
Crop yield	4.55	5	4.5
Median wage	4.50	10	5
Employee job satisfaction	4.50	11	5.5
Industry regulatory burden	4.50	9	5
Government expenditure on compliance monitoring	4.45	6	4.5
Mass of products produced	4.36	5	5
Hectares of land used	4.23	5	4
Workplace injuries	4.18	6	4
Number of FTE	4.00	6	3.5
Worker loneliness	3.68	5	3.5
Number of seasonal workers	3.36	6	3
Capital depreciation per hectare	3.23	3	3.5

On the following pages are shown charts for each of the above outcomes in the same order. Each chart shows the number of attendee giving each ranking (1-7) for each of the named outcomes. Note that the vertical axis scale (attendees count) varies between charts.






Carbon sequestered
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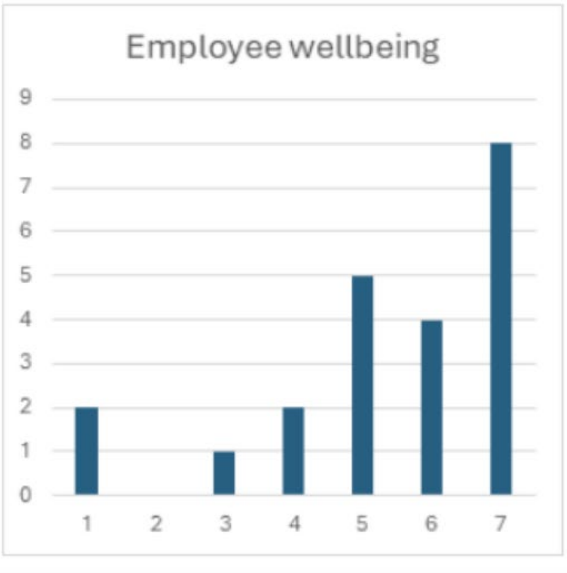
Employee wellbeing
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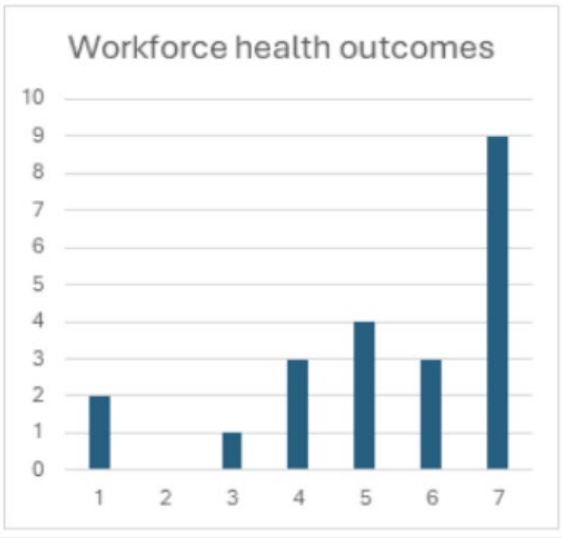
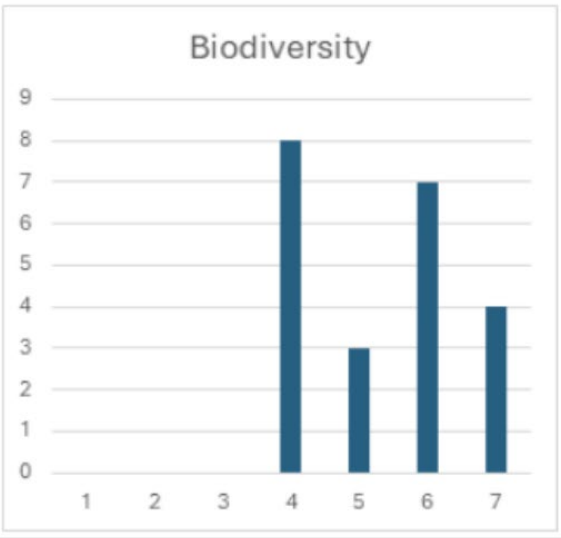
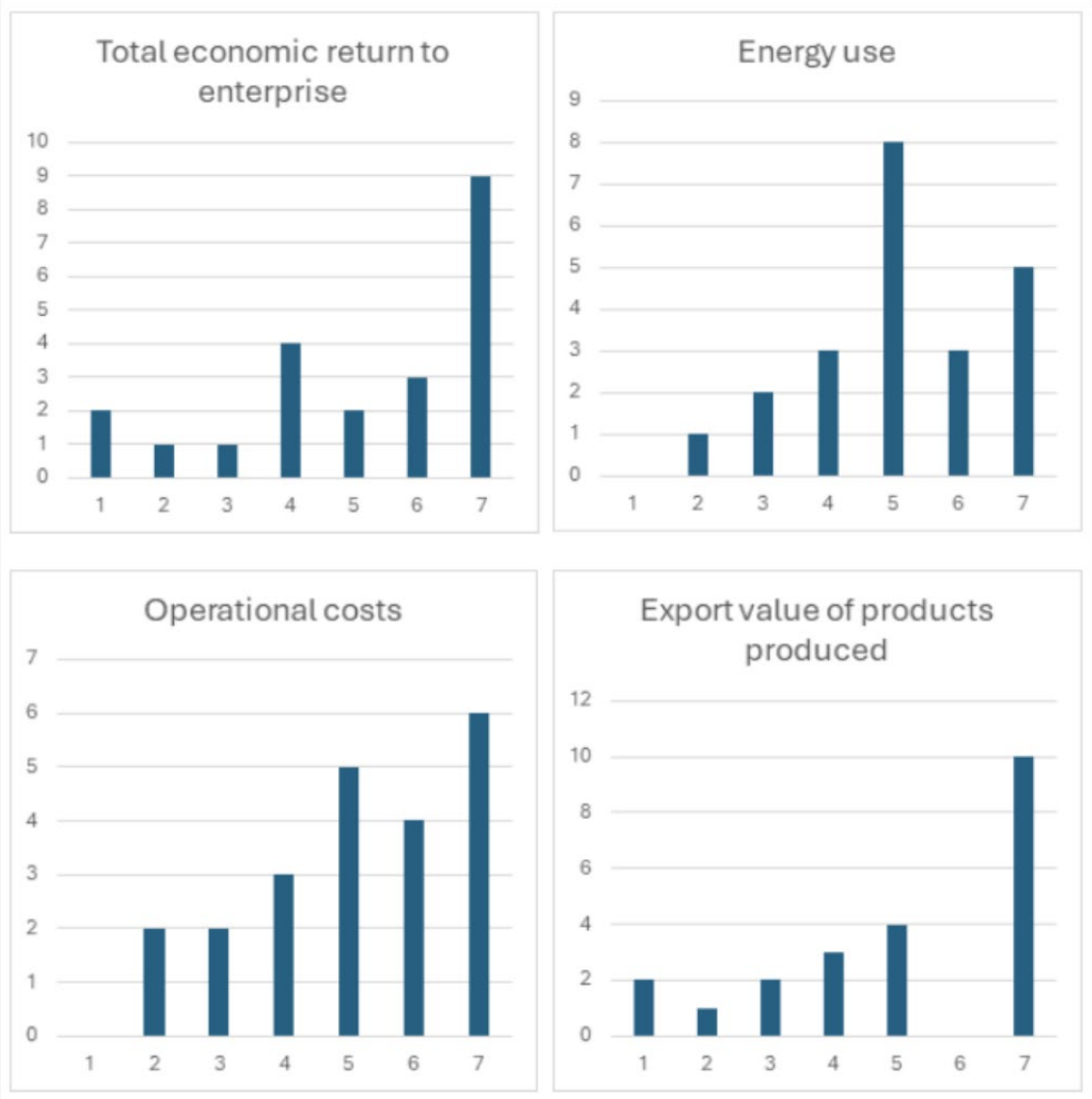
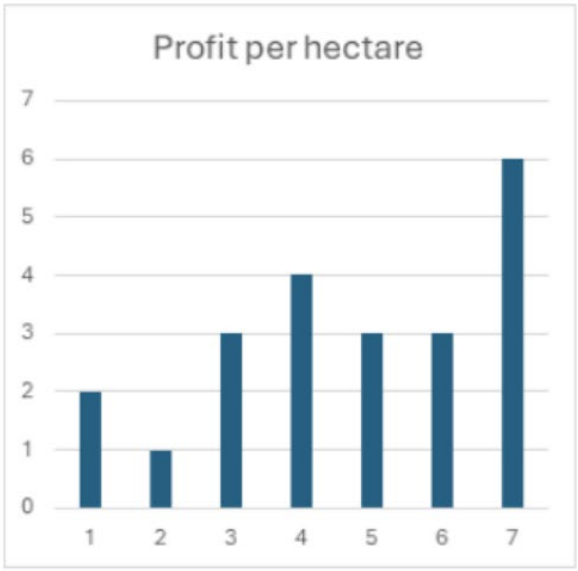
0
1 2 3 4 5 6 7

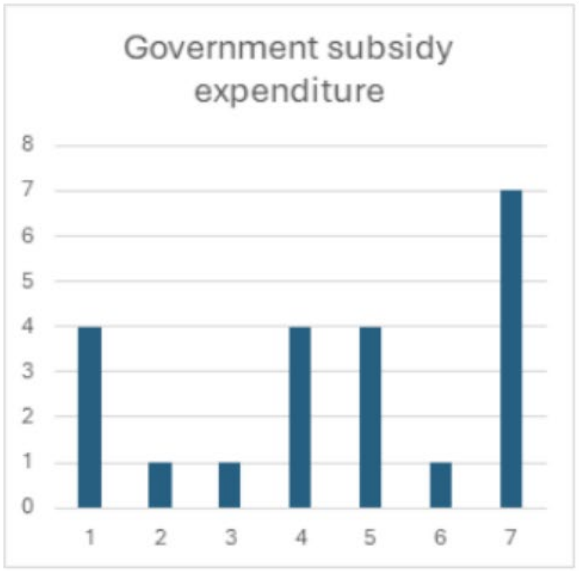

Workforce health outcomes
10
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7

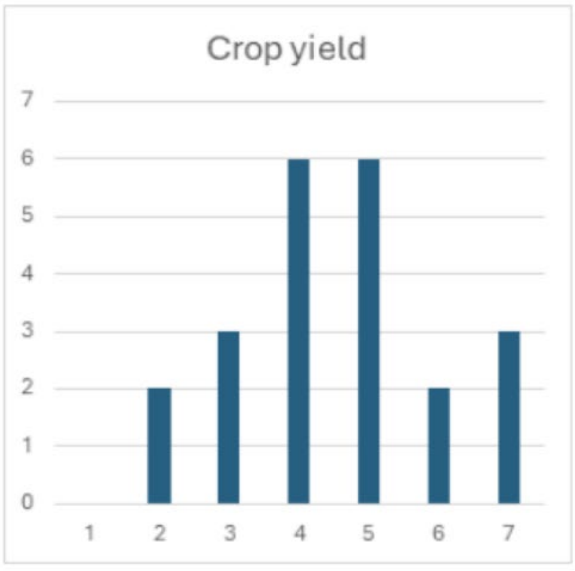

Biodiversity
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7

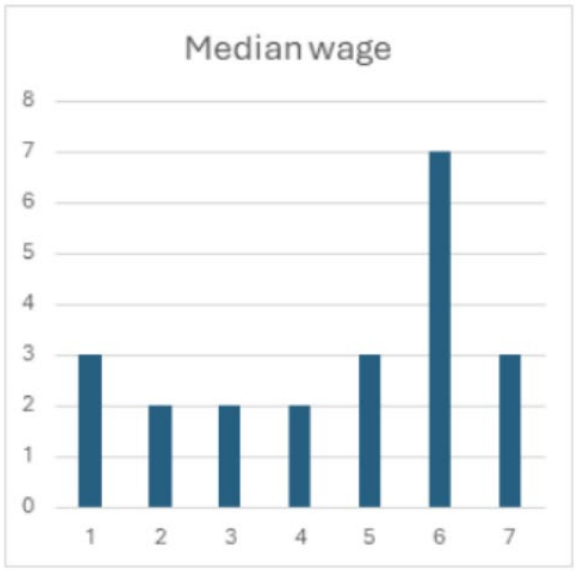

Total economic return to enterprise
10
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7
Energy use
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7
Operational costs
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7
Export value of products produced
12
10
8
6
4
2
0
1 2 3 4 5 6 7

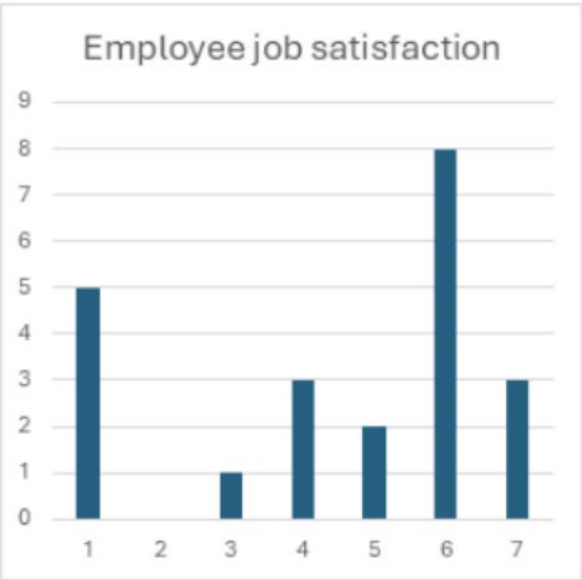

Capital investment for land use change
Workforce skills and qualifications
Total irrigation water used
Total fertiliser use


Profit per hectare
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7

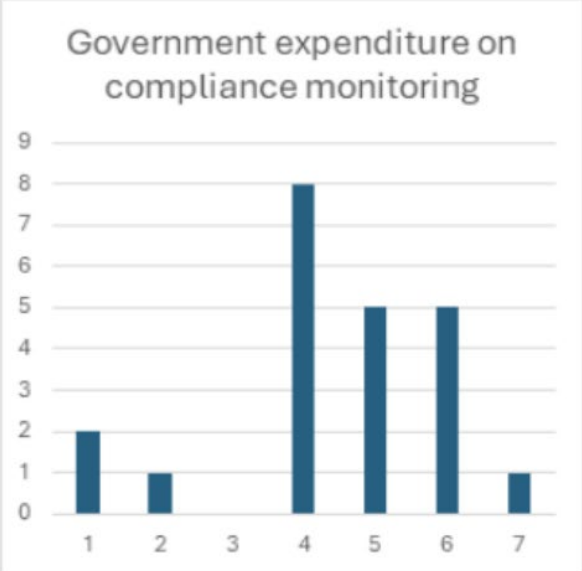

Government subsidy expenditure
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7

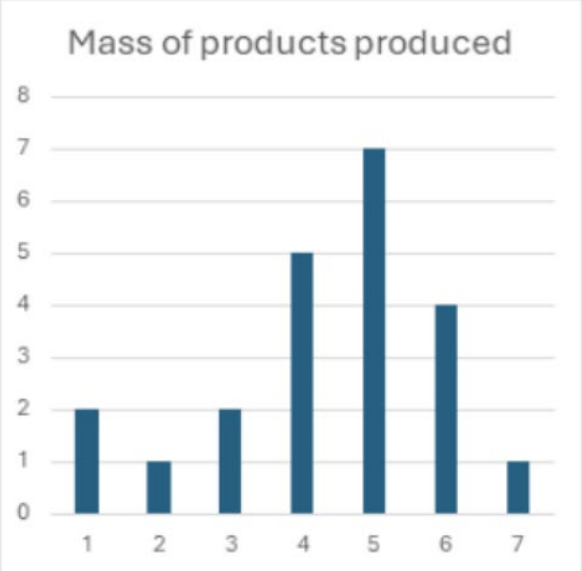

Crop yield
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7


Median wage
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7

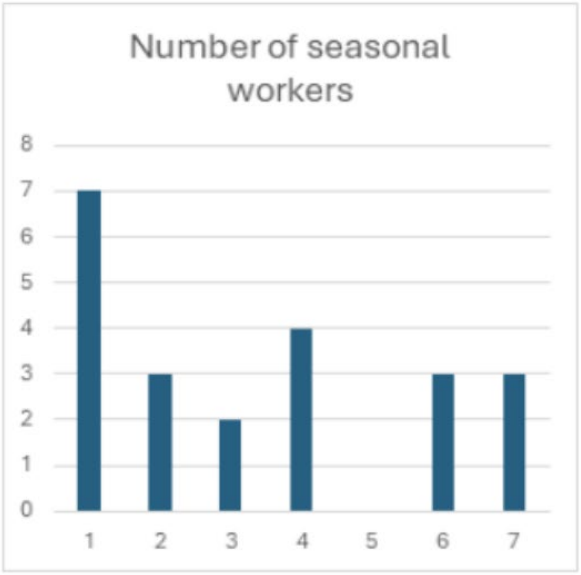

Employee job satisfaction
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7

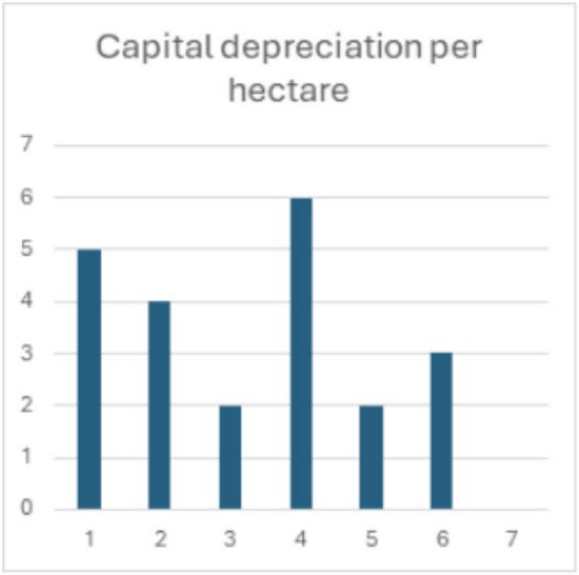

Industry regulatory burden
6
5
4
3
2
1
0
1 2 3 4 5 6 7


Government expenditure on compliance monitoring
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7


Mass of products produced
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7


Hectares of land used
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7
Workplace injuries
6
5
4
3
2
1
0
1 2 3 4 5 6 7
Number of FTE
6
5
4
3
2
1
0
1 2 3 4 5 6 7
Worker loneliness
6
5
4
3
2
1
0
1 2 3 4 5 6 7


Number of seasonal workers
8
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7


Capital depreciation per hectare
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7

Kai Anamata mō Aotearoa
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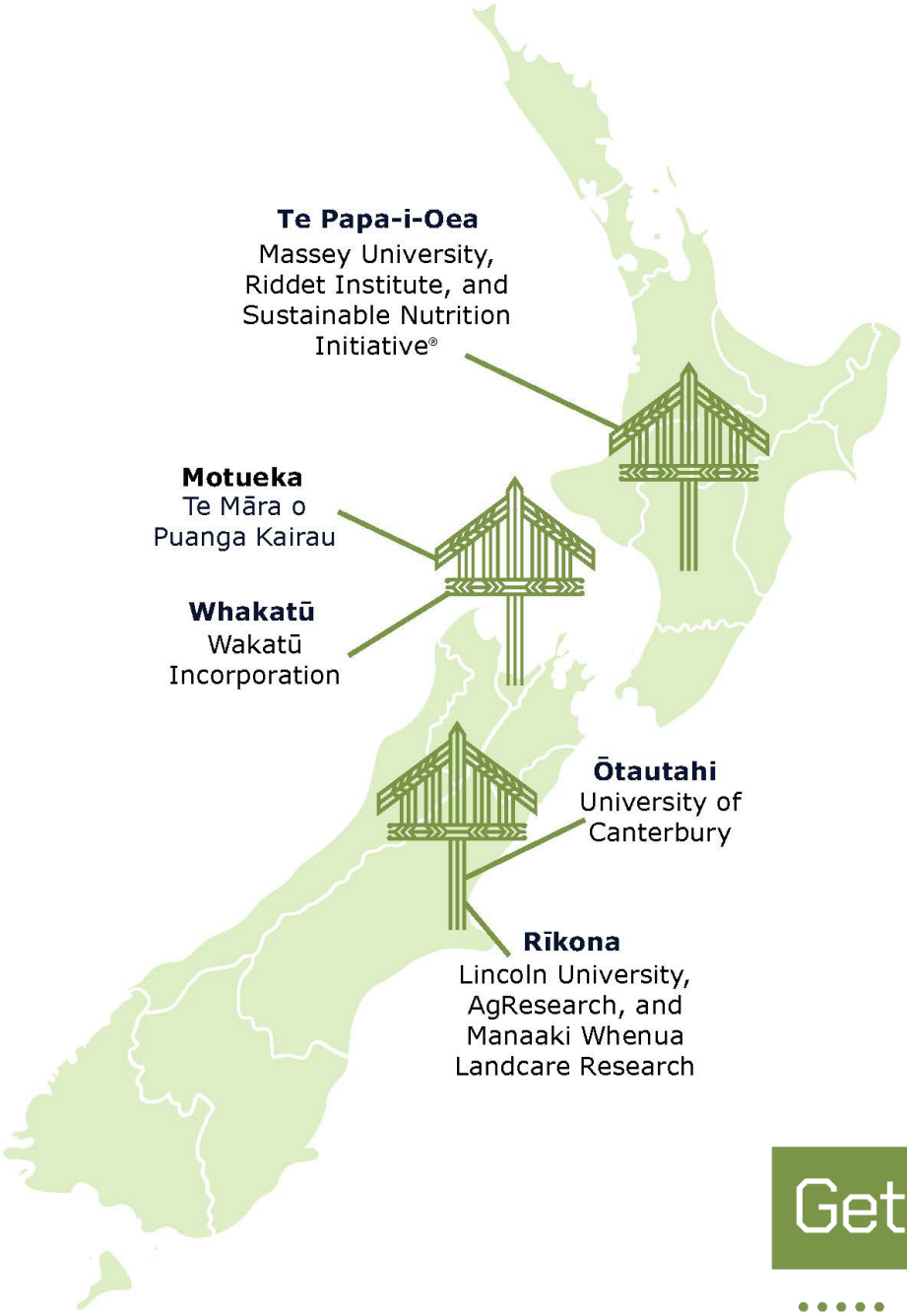

Get in touch

info@sustainablenutritioninitiative.com

www.kaianamata.co.nz