FUTURE FARMERS

Our Manifesto

A possible future for Aotearoa's food and fibre sector

Version 2.0

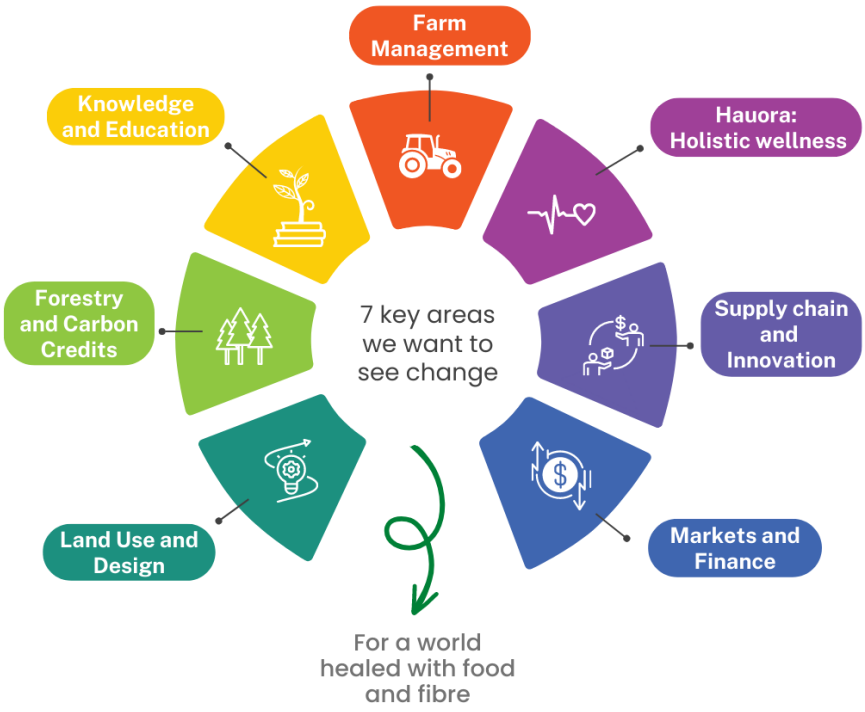
Updated June 2023

Executive Summary

New Zealand has a proud agricultural heritage, with farming providing a significant boost to national fiscal capital. The food and fibre sector employs tens of thousands of people and is vital for supporting small communities. However, this has come at a significant cost. Currently farming is a large contributor to greenhouse gas emissions, decreased water quality, and loss of biodiversity. These issues feed into social tensions in the form of a 'rural-urban divide' and negatively impact the mental health of those in the sector. We have learnt valuable lessons from generations of brave kiwi farmers, but now is the time for real change in the New Zealand food and fibre landscape.

We must inspire a new narrative where farmers are not just business owners, but custodians of our whenua. Climate change presents an opportunity to reassess our relationship with nature and redesign our food system, with farmers leading the charge. New Zealand is home to brilliant farmers, scientists, and innovators, and already possesses a green reputation on the global stage built on the high-quality products we produce. Using the blueprint for stewardship and regeneration provided by mātauranga, New Zealand can lead the way to a new era of food and fibre; while feeding, clothing, and healing the world in partnership with tangata whenua.

This manifesto identifies seven key themes, which outline key recommendations for a more sustainable food and fibre sector:



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Introduction

Future Farmers New Zealand supports a future of New Zealand agriculture that is healthy for not only the planet, but people and profit too. New Zealand has a proud agricultural heritage, and conventional farming systems have given us a significant temporary boost to our national fiscal capital stock as a massive export earner. However, this has come at a cost.

Agriculture makes up nearly 50% of our national emissions[1], we have the highest proportion of threatened native species of any country in the world[2], 82% of river length in pastoral farm lands are un-swimmable[3], up to 800,000 kiwis may have increased bowel cancer risk due to nitrates in water[4], New Zealand loses 192 million tonnes of topsoil per year[5] and 167 farmers have committed suicide in the last decade[6]. Additionally, valuable ecosystems like the Canterbury podocarp forest exist at less than 2% of their original extent; strong wool, the commodity that helped build our nation, is now burned or buried due to low prices, dairy farm debt is up 400% in the last 20 years to $40 billion[7] and growing tensions across the country exist around a so-called 'rural-urban divide'.

These are all key indicators that the current system is not sustainable and deep, meaningful change is needed. We have learnt a lot from our conventional farming systems but now is the time for change in the New Zealand farming landscape. In order to address the root of these problems, we must inspire a new narrative where farmers are not just business owners, but custodians of our whenua. We are presented with an opportunity to reassess our relationship with nature and redesign our food and fibre systems, with farmers leading the charge. As stewards of our land, they are uniquely placed to bring forward a future where we not only sequester more greenhouse gases than we emit, but also where we work in harmony with the land rather than against it.

Despite our current position, we have many assets that set us up to overcome these challenges. We have brilliant people; our farmers, scientists and innovators, a green reputation on the global stage built on the high quality products we produce, and most importantly, a blueprint for stewardship and regeneration in mātauranga Māori. No country is better suited than New Zealand to lead the world into a new era of agriculture; while feeding, clothing and healing the world in partnership with tangata whenua.

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[1] https://www.stats.govt.nz/indicators/new-zealands-greenhouse-gas-emissions
[2] https://www.wgtn.ac.nz/news/2019/05/nz-has-worlds-highest-proportion-of-species-at-risk
[3] https://www.stats.govt.nz/assets/Uploads/New-Zealands-environmental-reporting-series/New-Zealands-environmental-reporting-series-Environment-Aotearoa-2019/Download/environment-aotearoa-summary.pdf
[4] https://www.researchgate.net/publication/323148164_Nitrate_in_drinking_water_and_colorectal_cancer_risk_A_nationwide_population-based_cohort_study_Nitrate_in_drinking_water_and_CRC
[5] https://www.stats.govt.nz/news/land-report-highlights-issues-with-soil-degradation
[6] https://pubmed.ncbi.nlm.nih.gov/28410567/
[7] https://www.nzherald.co.nz/business/high-dairy-debt-may-curb-ability-to-meet-challenges-ahead-mpi-warns/VHK2N6CEXRNFODAGMJV5GQZ3WU/

Future Farmers is a group of youth who are passionate about building this new system. We are from a diversity of professional backgrounds, each working in our own corner of the industry to create change. Collectively, we want to inspire a new future for Aotearoa's rural landscapes and envision a pathway forward so urgent steps can be taken toward it. We know this future is possible to achieve. So let's get to it.

This document is for everyone: farmers, rural professionals, policy makers, politicians, industry groups, researchers, rural communities, urban communities, food eaters, nature lovers and anyone else who interacts with New Zealand's food and fibre system and wishes to see it develop into a system that supports healthy economy, people and planet. It is a summary of the changes we believe Aotearoa needs to make to get us moving toward this healthy future for food and fibre.

How this document works

Future farmers have crafted our manifesto to encompass 7 key **themes** that we believe are critical to achieving a healthy future for farming:

The 7 key **themes** are detailed in this report. For each section, we describe the vision we have for the future, what future outcomes could look like, and how we can get there. We then conclude with some key recommendations.

You may notice that our key themes for the future of farming do not include physical components of nature such as climate, biodiversity, water, soil and human health. This is because their degradation is simply an outcome of a broken system, of which is multidisciplinary. Therefore to restore nature to a state of health it is the system, not these individual components we must address. We don't silo these physical components, instead we weave it across each of the 7 themes. The regeneration of these elements is non-exclusive as they are innate to a healthy agri-food system, and therefore it makes sense to treat them as such when envisioning the future.

Disclaimer - This is a living document and will be constantly updated, subject to the consultation and evolution of ideas.

Key recommendations summary

This manifesto is split into 7 key themes that we identified as critical aspects of New Zealand's agriculture system that need to be redesigned in order to achieve a healthy food future. For each key theme identified, several key policy recommendations have emerged. These are the key changes that we must see implemented in the short term, as a way of jumpstarting New Zealand's journey to a thriving, regenerative food & fibre future.

1. Land Use Design and Management

- Establish 30% effective protection and restoration of each unique biome/ecosystem in NZ by 2050. Minimum targets must be given foreach ecosystem in New Zealand to align with the conservation requirements of the United Nations Sustainable Development Goals (SDG) to protect an area of at least 30% of all ecosystems by 2050[8].
- Every farm over 20ha must have a Farm Environment Plan (FEP) by year end 2024. Create a regulatory requirement and associated support for all farms to have a FEP with each farmer having a purpose statement. Farms are required to make continual improvements to the FEP based on increasingly ambitious environmental targets.
- One online dashboard for all farm compliance and reporting, with an API for management and other software. Enter it once, fed through all. This process must be co-lead with government, industry, iwi, farmers and farm management software companies such as Farm IQ, Resolution, My Farm Enviro and Overseer.
- The spatial mapping and digitisation of land use management at the catchment level must be encouraged to assist with future decision-making.
- Support and modelling for diverse and resilient land use systems that are best suited for our landscapes - a balance between climate change adaptation, consumer trends and what's viable on our land.
- Invest in resilience and quality assurance ahead of future trends across the supply chain and sectors while the prices are strong and demand good.

2. Forestry and Carbon Credits

- Build national policy around Future Farmers "hybrid producer levy approach" for emissions pricing.

[8] https://news.un.org/en/story/2021/07/1095772

- Create national emissions budget targets beyond neutrality by 2050. We must have climate positive (locking in more emissions than we emit) targets for 2075, 2100, 2150 and 2200.

- Emissions Trading Scheme (ETS) lookup tables need to be updated in accordance with Pure Advantage's recommendations.
- Foresters must have a plan to harvest short-lived exotic trees after 40 years, they cannot be planted in perpetuity as carbon forests.
- Regulation to be changed in increments over the next decade to unlock the ability to selectively fell new plantings of natives.
- Gross methane emissions are cut 20% by 2030 and 50% by 2050 from a 2021 baseline.

- Every farm over 20ha in New Zealand should have a carbon budget by end of year 2024 as part of He Waka Eke Noa implementation.

- Emissions and sequestration to be treated separately, as a liability and income stream respectively on farm accounts, with options for farmers to receive payment for emission abatement and carbon sequestration on both regulatory and voluntary markets.
- Increase scalability and accessibility of innovation and tech solutions

3. Knowledge and Education

- Create a platform for farmers and growers to access agricultural science and technology developments via a web portal and trained extension agents, including information on land use options, climate change, and other relevant challenges and opportunities.

- He Waka Eke Noa to champion and coordinate investment in diverse and resilient land use systems that are best suited for our landscapes - a balance between climate change adaptation, consumer trends and what's viable on our whenua.
- Teach critical and systems thinking in our institutions - built on a Maori world view and regen philosophy.
- Enable access to education for farmers on increasingly useful skills such as self-promotion, marketing.
- Government increasingly enables nationwide food and fibre system education programmes in schools.
- Information on agriculture career pathways to be given out in schools.
- Primary industry education to transcend cultural boundaries, namely urban and rural.

- Establish open access educational farms. These will be current working farms that have a dual purpose as education and research facilities, for school groups and public open days.

4. Farm Management

- In line with the freshwater reforms Nitrate in freshwater should be limited to no more than 1mg/L and a limit of 190kg/ha of N per year nationwide.
- Increased funding for research on multispecies winter crops with readily available data on both cost and yield.
- Restrictions on winter grazing are both practical and ambitious in reducing impact
- The disconnect between food and the sentient nature of animals is repaired at the consumer interface.
- Establish a regenerative agriculture certification programme and encourage the uptake of the wider philosophical principles associated with this approach including continual improvement.

5. Hauora: Holistic Wellness

- Develop a rural mental health strategy and supporting infrastructure, with both professional and community based support.
- Staff wellness is actively promoted on farms across New Zealand by employers.
- Emphasis on social support structures in funding schemes and within industry to increase social resilience.
- Connect farmers to their values and purpose to empower aligned actions.
- Invest in building the social capacity of farming communities in health and sustainability related matters.
- Mental health services proactively prioritise functioning supportive communities rather than exclusively acting as an ‘ambulance at the bottom of the cliff’.

6. Supply Chain and Innovation

- Government investment and public incentives given for creation of a circular economy and relocalisation of supply solutions.
    - Stabilise food security by increasing localisation and accessibility to food and fibre for all communities.
    - Empower people by encouraging polyculture farms close to urban centres.

- Import and other Natural Fibre tariffs are removed globally via New Zealand-led trade negotiations, with petroleum fibre sales to be taxed in New Zealand. Increase the quantity of enabling mechanisms to increase the uptake of natural fibres in building materials, eg. carpets and insulation.
    - Encourage processing facilities matched to land use types. E.g. wool and food processing infrastructure to be streamlined where possible in New Zealand.
    - Increase the quantity of enabling mechanisms to increase the uptake of natural fibres in building materials, eg. carpets and insulation.
- Encourage support for early stage impact ventures in the Aotearoa food and fibre community.
- Look for de-regulation opportunities for small scale local transactions to promote resilience and diversification through shorter supply chains.
- Future Farmers wishes to be part of the Gene Editing (GE) conversation in ways that ensure youth perspectives toward GE (in favour, against, or otherwise) are represented.

7. Markets and Finance

- Financial markets to be made available for ecosystem services. Actions such as eutrophication alleviation and biodiversity credits to reward farmers for restoration.
- Appropriate markets for externalities, emissions and nitrates which generate liability on farms happen in harmony with those markets that generate revenue.
- Impact pledges proliferate to fund farm adaptation to future trends and climates.
- National integrated accounting framework is adopted to account for natural capital accounts.
- Develop new financial opportunities to support land use change.

Land use design and management

The issue

Farming in New Zealand widely consists of a 'one size fits all' approach. One of the clearest examples of this is the shift toward intensification of dairy systems over the past 30 years. This has almost doubled the number of dairy cows in the country, while sheep numbers have halved [9]. This land use conversion has occurred in many areas that are unsuitable for dairy. Variables such as soil type, depth, texture, drainage, aspect, fertility, chemical composition, slope and erosion risk, as well as topography, ecological limits, accessibility and climate all determine the land use suitability for a given farming practice. To date, many of these have received relatively little consideration in land-use management decisions and the resulting unsuitable land use is causing significant damage to soils, waterways and animal health (for example the practice of winter grazing on soils prone to leaching or erosion). We know that such considerations of land use suitability must be taken on board for the development of future landscapes and production systems.

The strategic allocation of land to diverse farming and conservation operations based on its suitability for that land use is a strong base for multifunctional landscape design. The management of any given landscape and its resources determines the health of the ecosystem services it can provide to our society. Therefore, the creation of well managed and diverse agricultural landscapes can fulfil multiple landscape services, while also producing food and fibre in a profitable manner.

The Vision

Our vision for the future of land use management and design is:

1. Design ecologically diverse agroecosystems
2. No "one size fits all" approaches
3. Mountains-to-sea design planning
4. Fully integrated biodiversity (land sharing)
5. Finding balance between production and ecosystem limits
6. Build flexibility into land use regulation
7. Design multifunctional landscapes

1. Design ecologically diverse agroecosystems

[9] https://www.stats.govt.nz/indicators/livestock-numbers

Future Farmers believe that designing ecologically diverse farms has the potential to strengthen New Zealand's entire farming system. Ecological diversity refers to the biodiverse presence and abundance of native and endemic species within agricultural landscapes, but also the diversity of species grown for their productive values.

New Zealand has the highest rate of at-risk or threatened native species in the world. The agricultural sector is a critical player in achieving regional and national conservation goals and it is clear that our native flora and fauna can play a much larger role in our farming landscapes. Agricultural land currently makes up 60% of New Zealand's total land use (approximately 40% sheep and beef, 10% dairy, and the remaining 10% is a mix of deer, lifestyle blocks, arable and horticulture[10]). Yet there is currently no national strategy for managing or restoring biodiversity on farms. Nor is there current regulation or consistent mechanisms for measuring and improving biodiversity despite farmland, particularly pastoral landscapes, being a significant habitat for New Zealand endemic species[11].

Providing habitat for native plant species so they are commonplace in agricultural landscapes is essential. But native species could also be fully integrated into the active farm system itself as medicinal and grazed species. Land sharing approaches must be encouraged so biodiversity thrives across agricultural and conservation landscapes.

Similarly, the exotic species we grow, harvest and farm can be diversified. For example, at the farm scale, increasing the diversity of plant species growing together supports the growth of healthy and diverse soil microbiota. Where different species above and below ground can share resources they contribute to the creation of a healthy, more resilient farm ecosystem.

By creating farm systems that have both high native biodiversity and crop diversity, there is greater ecological redundancy in times of climatic stress. Beneficial invertebrates and insects attracted by these habitats also provide protection from fungal, bacterial and pest insect attack on fragile crops, potentially reducing reliance on chemical intervention. Diversification can provide farmers with additional economic security as they have a variety of species on the farm to draw revenue from.

The more simple a system, the more fragile. While it is important to balance the trade-off between diversity and efficiency, we must diversify our landscapes to ensure New Zealand’s food and fibre systems are fit for a more challenging and changeable future.

What would this look like in reality?

- Shelterbelts contain either native or harvestable food-producing species

[10] Pannell, Jennifer L., Hannah L. Buckley, Bradley S. Case, and David A. Norton. “The Significance of Sheep and Beef Farms to Conservation of Native Vegetation in New Zealand.” New Zealand Journal of Ecology 45, no. 1 (2021): 1–11.
[11] ibid

- Stock shelter trees are diverse, ecologically suited to the land and contribute to biodiversity outcomes (e.g. nectar)
- Farmers increase financial stability as they have the ability to access multiple revenue streams from multiple harvestable (crop, tree, livestock diversity), or non-harvestable (biodiversity or carbon credits) sources.
- Knowledge about the integration of native species into farming landscapes is driven by a partnership between western science and mātauranga.
- Native biodiversity flourishes on the farm and in the catchment while being integrated to support multiple economic, amenity, ecological and cultural values.
- New Zealand endemic and native species population sizes improve and move down risk categories
- Strong support from industry, regional authorities and farmers enables implementation of Te Mana o te Taiao at regional and farm level

2. Flexible management: No “one size fits all” approaches

New Zealand’s agricultural landscapes are highly diverse. From the year-round grass growth in the Waikato to the brittle tussocklands of Central Otago, a highly nuanced approach to farming practice is needed. Not only can there be variation within a catchment on best practice, but there can be a need for variation of practice within farms.

We want to see improvements being made to the accuracy at which we can determine the best land-use and practise for our whenua. Taking an approach to land use that ensures that the right animal or crop is in the right place, at the right intensity, is crucial to creating a farming industry that can support our natural ecosystems and our farmers to thrive.

A no-one-size-fits-all approach to land-use and practice inevitably means that there should be no one-size-fits-all approach to the way we plan and manage those landscapes either. The national approach to managing the environmental impacts of agriculture must take into account the diversity of agricultural land and how it will shift due to climatic and other factors over time. Approaches that ‘fit’ a locality now, may not in the future, so we must be ready to adapt our ‘best practices’ and land use to meet market demands, shifting climatic factors, and the development of knowledge and technology available to us.

What would this look like in reality?

- Policy and regulation is adaptable and flexible in the face of a changing climate, advances in our biodiversity goals, and shifting consumer preferences
- ‘Best practice’ is determined at local (potentially catchment) levels, rather than through national regulations

- Different regions suffer from varying levels of biodiversity loss and restoration should be treated with varying levels of urgency based on threat to species in each region.
- User-friendly, scientifically evidenced databases available to help guide farmers through complex decisions for land-use management and farming type suitability.
- Robust and experienced network of extension specialists held to a high standard, available to assist farmers with complex decision-making processes.

3. Mountains to sea design planning

For effective land use management, it is essential to have catchment and cross-catchment level design approaches. Currently, biodiversity and water quality considerations are considered primarily within farm boundaries. However, farm boundaries constructed by concepts of land ownership are arbitrary when it comes to managing wildlife, critical habitats and hydrological systems that span entire landscapes.

For this reason, a mountains to sea design approach is needed so that we can plan on a scale that crosses fence lines and regional borders. This will allow the whenua and the life living upon to be cared for through much larger and more integrated spatial scales.

Rewilding offers a novel approach to restoration across catchments, letting look after itself and enabling natural processes to shape the land, restore degraded landscapes and repair damaged ecosystems. Rewilding does not exclude land stewards, rather it relies upon our assistance through stock management, pest control, woody weed control and supplementary planting.

Only 10% of New Zealand's wetlands remain[12]. These ecosystems offer critical ecosystem services including erosion mitigation, flooding prevention, eutrophication alleviation, carbon sequestration and biodiversity support.For example only 2% of the Canterbury podocarp forest remains[13]. This is a national travesty. This and other degraded ecosystems should receive significant restoration attention.

Sufficient habitat for native biodiversity must be provided so that 30% effective protection for each ecosystem is given by 2030 as aligning with the United Nations Sustainable Development Goals. This will require regional strategic plans for biodiversity restoration and protection, land optimisation models with a focus on restoration on low production value and public land. This can build on existing projects such as the Te Ara Kakariki project in Canterbury.

[12] https://www.rnz.co.nz/news/national/460758/nz-wetlands-climate-heroes-need-to-double-in-size-campaign
[13]https://www.doc.govt.nz/globalassets/documents/conservation/native-plants/motukarara-nursery/canterbury-plains-plant-communities-book-full.pdf

What would this look like in reality?

- Conservation goals are shared between farms to have impact at scale. This can be achieved through active catchment groups, including multiple stakeholders.
- Nature corridors are facilitated across farmland to connect Department of Conservation reserves and other sites of significant biodiversity.
- Migratory pathways of native fauna are maintained and improved through effective large scale planning.
- Every ecosystem has planned restoration projects to restore them to a minimum of 30% pre-human settlement extent by 2030 if they are below the 30% threshold.
- Water quality legislation is developed in partnership with all stakeholders and administered by regional councils
- Real-time water quality measurements enable tracking of pollutants across landscapes for more effective landscape-scale management.
- Water-use allocation for all users is developed through a whole catchment design framework in partnership with all stakeholders in the catchment

4. Finding balance between production and ecosystem limits

New Zealand's agricultural industry was founded on being an exporting food basket, first for Britain, and then the world. As such, for a long time our farming has been tied to an ideology of contributing toward global food security. As the global population increases and land prices continue to rise beyond inflation, it is increasingly important that our land use is optimised to a balance of production and environmental outcomes. We have historically externalised the environmental costs of a production-driven system. This system has provided us with many benefits as our country developed, but it is clear that it is not sustainable. As we move into a new era of agriculture, we now have both the privilege and the responsibility to shift toward a new system: one that can find balance between production and the limits of our ecosystem.

In some cases finding balance may require shifts in land use. We acknowledge that this may be confronting for some areas of the industry which may need to shift or even be replaced by more efficient farming systems for that locality. But without appropriate land-use, we cannot hope to create an industry that meets our social, economic, climatic and ecological goals. Ecosystem services, conservation, effective food production and economic return are all factors which must be considered in synergy.

Tenure review is a contentious policy topic inland use management. Trade-off between public access, conservation value and maintaining agricultural production needs to be optimised in the uncertain future of the remaining 100 or so high country farms still under pastoral lease. There needs to be an updated cross-party consensus on the future of these leases, which considers a consultation process built on the principles discussed in this document.

What does this look like in reality?

- Land-use is determined by the ecosystem limits of any given locality. A doughnut economics approach is embedded into land-use management and design approaches.
- Commodity prices do not completely dictate land use design (as is the growing case for carbon forestry) and diversity is maintained despite fluctuations in market prices.
- Non-extractive resource use is encouraged and local resource utilisation remains within ecological limits.
- Regulations adapt and change with our conservation goals, climate volatility and consumer trends

- The future of remaining high country farms under pastoral lease is debated, and cross party consensus is developed on the future of their leases.

5. Multifunctional landscapes

Our landscapes must transition from uni-functional spaces, to well planned multi-scapes with overlapping industries. Pastoral agriculture, forestry, horticulture and other primary industries cannot occur in silos, instead being well designed landscapes which enable different businesses to share resources and infrastructure while supporting each other to achieve biodiversity, health and community goals.

Collaboration across industries such as tourism, agriculture and urban spaces can similarly allow for effective land-use in a multi-scape. For example, in rural areas, tourism and agriculture are already beginning to develop as overlapping and nested industries with the explosion of ecotourism. It is important that the development of different industries to create multiscapes is supported going forward to ensure these collaborations create the best outcomes for restoring ecosystem services and contribute to thriving communities.

However far more opportunities come from multiscape design than ecotourism alone. Agricultural innovation is enabling different production systems; vertical farming and hydroponics are increasing in feasibility and scale in New Zealand. These types of farming could be integrated into urban spaces far more efficiently than traditional pasture and crop farming. As such, New Zealand science and policy should be ready for the increasing prevalence of hydroponics and vertical farming. Urban agriculture must increasingly be considered, to integrate food production into urban settings. Cost benefit analysis for these kinds of farming Should include social, environmental and economic impacts. Farming in urban spaces has the potential to reconnect urban people with often distant farming systems, increase understanding and appreciation of food production realities and particularly improve urban food security. Food waste can also be sourced more easily from cities, which may provide opportunities to design more circularity into our farming systems. Farming should not be limited

to rural areas and must increasingly happen on street curbs, high rise buildings and throughout cities, bringing people closer to their food.

What does this look like in reality?

- Effective cross-industry collaboration to enable pooling of resources for the achievement of shared goals.
- Communal land-use solutions are created such as the integration of silvopasture where appropriate so horticulture and pastoral farming businesses can overlap.
- Spatial landscape planning to balance different industry, community, and ecosystem priorities.
- Urban agriculture is supported to develop into commercially viable systems that improve local food security and community resilience (particularly in times of supply chain disruption).
- Funding is provided for research on integrating multiple land-uses into a locality.

Key recommendations

Our initial key recommendations for how to reach this vision for land-use design and management are:

- A national plan and strategy for biodiversity on farmland is urgently needed. It must be created by the Ministry for Primary Industries, in partnership with all stakeholders.
- Effective protection and or restoration given to 30% of each ecosystem in New Zealand to align with the conservation requirements of the United Nations SDG.
- Create a regulatory requirement for all farms over 20ha to have a Farm Environment Plan (FEP) by year end 2024. Farms are required to make continual improvements to the FEP to align with recommendations in this document.
- Spatial mapping and digitisation of land use design must be improved and scaled up to assist with future decision-making.
- Create support structures for farmers to diversify operation and transition to farming systems that move with consumer preference.

Forestry and Carbon credits

The issue

The climate crisis is the preeminent challenge of our generation and will undeniably impact the future of agriculture significantly. Not only must our land and farming practices adapt to a changing climate, our land management must also enable us to increase carbon sequestration in harmony with our water quality, biodiversity and community goals.

Forestry and pastoral grazing, as some of the key industries of rural areas, have often competed for land use. The need for carbon sequestration has recently driven this competition to new heights. The increasing price of carbon is leading to rising land prices as pine forestry for carbon credits becomes more profitable than pastoral farming and is encouraging large scale land conversion to pine. This conversion decimates rural communities and causes major changes to ecosystem functions.

Carbon sequestration and forestry are critical parts of how New Zealand mitigates and adapts to climate change. However, the methods through which carbon reduction goals can be achieved must be integrated with biodiversity and community goals to create win-win nature-based solutions.

New Zealand currently has a globally well regarded national emissions trading platform. However, currently the agricultural industry is excluded from this programme. The way in which agricultural emissions are priced and farmers are rewarded for sequestration will undoubtedly change the nature of our food system.

The Vision

1. Farmers become allies in carbon sequestration
2. Greater variety of vegetation types are recognised for carbon trading
3. Native forestry to be encouraged over exotic
4. Production forestry is managed to address erosion and damage
5. New Zealand has a clear plan for agricultural emission and sequestration trading
6. There can be no excuse for complacency in the climate fight

1. Farmers become allies in carbon sequestration

Sheep and beef farms make up 40% of New Zealand's land mass, presenting significant opportunity for increased carbon sequestration. Farming systems can be net sinks of carbon rather than sources. By modifying farming practices, the soils, forests, tussocks, and wetlands present on farms can offer valuable carbon sequestration potential.Similarly the rise of carbon-positive farming practices such as silvopasture, permaculture and other regenerative practices present opportunities for farms to contribute towards national carbon reduction goals.

There is a growing global consumer demand for low carbon or carbon positive products. Taking climate action can be a win-win for farmers as they build ecological health on their farm and meet the sustainability demands of premium markets. Agriculture and forestry are unique in their ability to be carbon positive, and therefore represent key opportunities to lower atmospheric carbon. A carbon positive goal means sequestering more than we emit and is needed to remove historical emissions. New Zealand's farmers must be supported to become global leaders in carbon sequestration.

What would this look like in reality?

- The narrative of climate change becomes based around opportunity, rather than a threat to farming in New Zealand
- Farmers are provided with strong support systems to encourage the sequestration of carbon that also meets biodiversity, economic, cultural and social goals.
- An increase in carbon farming (carbon-positive) land use uptake, forestry of native and endemic trees. This may include the increase of silvopasture and permaculture solutions.
- Farmers are empowered to realise their potential as a solution to climate change and New Zealanders are proud to have climate action embedded into our agricultural landscapes.

2. More vegetation types recognised for carbon trading

Currently, the ETS is inaccessible for kiwi farmers, with high upfront consulting fees and legislation that favours large forestry blocks over regenerative native bush on farmland. If we are to encourage large scale carbon sequestration that meets other social and ecological goals, it is critical that New Zealand creates avenues for more vegetation types and sizes to be recognised in carbon trading schemes. New science will enable us to access new methodologies for carbon trading, for example, through the development of novel soil carbon methodologies for scrubland and tussock.

In both the regulatory and voluntary markets farmers should be able to access increasing types of carbon credits that meet additionality and permanence requirements. Farmers must simultaneously be liable for their emissions while being rewarded for sequestration.

What does this look like in reality?

- Carbon revenue portfolios are diversified to include a variety of forms of natural carbon storage such as wetlands, native forests, tussock land and soil carbon.
- Voluntary carbon markets are supported and encouraged to diversify payments for carbon sequestration efforts on farm.
- Price futures should be available on voluntary markets to facilitate investment in novel farm practices such as the markets created by Toha[14].
- Farmers that meet additional requirements and provide verification for high quality emission abatement credits are able to receive credits for their emission reduction.
- The ETS adapts quickly to new methodologies for carbon trading and facilitates fast micro transactions for farmers nationwide with low consultation fees.
- Ultimately Asparagopsis (methane reducing seaweed feed supplement), methane vaccines, low genetic stock breeds and other ways of cutting methane emissions are recognised with the ability to receive carbon credits via globally standardised abatement methodologies.
- Introduction of a national strategy to plant shelterbelts and integrate trees wherever possible into agricultural landscapes including native trees, food producing trees and timber trees that offer biodiversity, cultural and economic gains.
- Soil is recognised for carbon sequestration when managed sufficiently.
- Gross methane emissions are reduced from a 2021 baseline by 20% at 2030 and 100% at 2050. This 20% by 2030 is halfway between the global methane pledge and NZ current targets balancing viability with globally agreed values while driving innovation and research.

3. Native forestry to be encouraged over exotic

Pine forests have high initial carbon sequestration rates, but have a negative impact on biodiversity and water cycles. Carbon farming with pine trees also is a relatively small contributor to local communities and economies as they threaten sheep and beef farming and traditional timber forestry.

[14] https://www.toha.nz/

In comparison, native forests are biologically diverse, support healthy water cycles and hold cultural significance, while also sequestering carbon for a longer duration than pine. Native forestry must be the dominant form of forestry used for carbon credits.

Other ecosystem provisions must also be monetized so a wider range of ecological dimensions are considered in forestry, conservation and restoration projects. For example, biodiversity credits can provide economic pathways for our native biodiversity to be valued, protected and incorporated alongside carbon into financial and economic decision making in rural landscapes.

What would this look like in reality?

- Biodiversity and water impact are priced into the true cost of pine credits.
- Prevention of the planting of exotic forests in perpetuity for carbon sequestration.
- Native carbon credits should be traded at a significant premium on the ETS.
- A diverse supply of native trees promoted in lumber markets and sustainable harvest of new plantings of natives to become established.
- New Zealand farmers can access native bush carbon credits amongst a diverse potential portfolio of carbon revenue to encourage sequestration on farm.
- Farmers are ultimately able to receive payments for ecosystem services beyond carbon from ecosystem service markets, like biodiversity credits for habitat protection and eutrophication alleviation credits for restoring waterways.
- Eco-sourced planting is encouraged wherever possible.

4. Production forestry needs to mitigate environmental impacts

Many regions had industrial Radiata plantations established on steep and fragile terrain both with and without government support. These plantations have held the soil together and reduced risk of erosion and landslides while standing (compared to pasture). However, the industry's persistence in using clear-cutting as the only viable harvest system, particularly on steep and/or fragile land, has been a large part of the problem.

Large and extreme rainfall events were not uncommon in the past but now with climate change, the frequency and intensity of these events is creating havoc, particularly after extensive clearcutting and for 5 to 8 years following (the so-called 'window of vulnerability'). The impacts are not limited to slash moving off hillsides into waterways, onto land downstream and into the marine environment in large or extreme weather events.

Sediment is even more pervasive. The amount of sediment entering waterways, inundating land and damaging estuaries and the sea will be greater in volume and impact than the slash in any

given event. It's less visible and rarely quantified. While mobilised slash may result in damage to farms, houses, and infrastructure, sediment is ubiquitous everywhere downstream, even in moderate rainfall events. Fundamentally, we need to acknowledge that the scope of the problem goes far beyond the damage caused to the built environment.

What would this look like in reality?

There are several key areas to address the inadequate management of fragile land, while achieving high-quality timber output. We strongly encourage that all of these recommendations are implemented at all stages of the supply chain and beyond.

Research

- Urgently increase funding for research into timber species of higher value that possess higher root strength (more stable), or retain live root systems.
- Urgently increase funding for research into alternative harvest systems (shelterwood & continuous canopy) that reduce the risk of erosion, landslides and sedimentation.
- Urgently increase funding for research into the viability of more appropriate harvesting (felling and extraction) equipment that reduces ground disturbance, sedimentation and landslides.
- Develop a comprehensive Standard (structure, format, process and training) for full cycle forestry risk assessment. Develop an industry-wide tool that allows forest managers to match management options with the assessed risk.

Policy

- Amend the NES-PF Regulations to include limits on clearcut size and aggregation.
- Amend regulations to specify realistic limits (by location or susceptibility) for non-point sediment discharge, particularly suspended sediment.
- Amend regulations to set specific limits on the size of slash and debris that may be left on the cutover site.
- Amend regulations to allow Councils to require amendments to, or rejection of, Harvest and Earthworks Plans.
- Introduce government-imposed penalties for Councils that fail to implement changes to their resource management plans within specific timeframes and that fail to set and implement effective policies for compliance, record-keeping and enforcement.

5. New Zealand to have a clear plan for agricultural emissions and sequestration pricing

The current targets for emission reductions as set out by the climate change commission are not sufficient for New Zealand to meet our climate goals. Agriculture must reduce emissions at rates

comparable with other industries and be included in the New Zealand ETS. As such, farmers need clarity if the ETS will be administered at the farm level or industry group level. The structure of regulatory and voluntary markets must change to make it easier for farmers to register their regenerating native bush for carbon credits. Financial incentivising of farming practices that sequester carbon must be encouraged.

What would this look like in reality?

- A wider range of vegetation types are eligible for carbon credits so farmers can realise the true value of their farms carbon sequestration, e.g. shelterbelts, non woody vegetation and tussock.
- Every farm in New Zealand must get its carbon budget number by the end of 2022 as per He Waka Eke Noa legislation.
- The 'carbon' centred climate change conversation must instead focus on greenhouse gases, which include methane and nitrous oxide allowing for the split gas approach.
- Future Farmers He Waka Eke Noa position statement[15] recommendations are taken on board.
- Agricultural emissions are offset by a producer levy, this levy starts at 5% in 2025 and increases by 2%, 3%, 4% each year until 2030 to cut agricultural emissions by 20%.
- Emissions and sequestration should be treated separately, as a liability and income stream on farm accounts. This simplifies the process and means farmers can access different sources of revenue for their sequestration than just the regulatory market.

6. There can be no excuse for complacency in the climate fight

A common excuse that is used for climate inaction is that New Zealand is too small to make a difference on the global stage. While it is true that New Zealand has a relatively small contribution to global emissions (0.14%), New Zealand also emits more than the global average for emissions per capita and has a significant leadership role to play globally in climate action. Our innovation in agricultural technology and policy can inform global climate action beyond merely moving the dial on our own carbon budget.

Furthermore, this narrative is embedded in the ideology that responding to climate change is a burden, when in fact, it is an opportunity for embedding nature-based solutions into our industry and futureproofing our communities and our economy. Regardless of our size, we have a responsibility to act, for both the global community, and for ourselves and future generations. The risks of inaction are very well known. There is no excuse for complacency.

[15] https://futurefarmersnz.org/hwen-submission

What would this look like in reality?

- We need to have emission budget targets beyond neutrality and 2050. We must have targets for 2100, 2150 and 2200. These should be targets where we become carbon positive, locking in more emissions than we emit, which are integral to reversing the damage of climate change.
- A yearly goal of 0.4% increase in top soil carbon on farms in New Zealand where possible and soils are low in carbon to align with New Zealand voluntary commitments at COP21 for the '4 per 1000' initiative[16].

Key recommendations

Our initial key recommendations for how to reach this vision for forestry and carbon credits are:

- Create national emissions budget targets beyond neutrality by 2050. We must have carbon positive (locking in more emissions than we emit) targets for 2100, 2150 and 2200.
- Foresters must have a plan to harvest pine trees after 40 years, they cannot be planted in perpetuity as carbon forests.
- Regulation should be changed in increments over the next decade to unlock the ability to sustainably fell new plantings of natives.
- Native carbon credits are traded separately in ETS.
- ETS lookup tables need to be updated in accordance with Pure Advantages recommendations.
- Agricultural emissions should be priced by a producer levy and cut by 20% by 2030 and 100% by 2050.
- Every farm in New Zealand must get its carbon budget number by the end of 2022 as per He Waka Eke Noa legislation.
- Emissions and sequestration should be treated separately, as a liability and income stream on farm accounts, with options for farmers to get payments for emission abatement and carbon sequestration on regulatory and voluntary markets.

[16] https://www.4p1000.org

Knowledge and Education

The Issue

Education is a critical enabler of the transition to a sustainable food future. Without education, it is difficult to ask farmers to take risks on their farm by changing practices or adopting new technology, or see the opportunities that lie in their ability to be climate action heroes. We also cannot expect the public to make good consumer or political choices that support sustainable farming practices without understanding what is at stake in a business-as-usual agricultural approach. Therefore, the power of society to shift to a sustainable food system lies in education.

Currently, many New Zealanders are unfamiliar with how farming works in New Zealand and where their food comes from. As such there is currently a disconnect between those who live rurally and those who occupy urban areas. Additionally, as our knowledge of best practice and tools for sustainability develop so rapidly, it can be hard to keep up with the best actions for change. Addressing these components will stimulate knowledge and a sense of empowerment that will enable other areas of the industry to transition far more effectively.

The Vision

Future farmers have identified four broad education-based components of our vision for the future:

1. Improving food system literacy
2. Rewriting the narrative of farming: the urban-rural divide
3. Supporting transitions: Accessible and digestible science
4. Careers in the agricultural industry

1. Improving food system literacy

We want a population where everyone knows and understands the importance of how climate change and food production interact. The connection between ecosystem services, our economy, and future food supply is not yet common knowledge and understood by the general public and our industries.
Basic ecological literacy such as understanding how landscapes function and knowing where our food comes from and how it is produced should be a central part of our foundational knowledge, in the same way we learn to read, write and apply mathematics. Food system

literacy must be included in our schooling system. Through programmes in schools that encompass both in class learning and visits to local farms, children will grow up with a greater understanding and respect for where their food comes from. This education should include te ao Māori perspectives of farming and food production, alongside Western ways of understanding our food system.

Food system literacy will not only help to close the rural-urban divide but will also create healthier and more resilient communities as consumers will grow up understanding how their food is made, who makes it and how what they eat directly impacts their health and the planet.

What would this look like in reality?

- Increased education on food system literacy and sustainability across all school levels.
    - Primary and Intermediate school:
        - Children are taught about food production, mahinga kai, food waste, food recycling, cooking food and why it is important. Projects such as Garden to Table[17] are embedded at a national scale.
        - Farming centred projects to embed food, fibre, and farming literacy into school curriculum such as writing a letter to a farmer, sponsoring a calf or lamb, and field trips to a farm.
    - High school:
        - Agroecology and food system topics are a compulsory part of biology and social science courses in school curriculum.
        - Promote the primary industries as career pathways for both urban and rural high school students.
    - Tertiary:
        - All agriculture related degrees have compulsory engagement with farms.
- Greater collaboration and the creation of integrated policy between relevant government ministries such as health, environment, primary industries and education.
- Indigenous knowledge and heritage of Aotearoa should be valued as an important part of food system literacy in New Zealand. Acknowledging mana whenua and all of those who have come before us must become a part of our education programmes.

2. Rewriting the narrative of farming

Alongside building general food system literacy in New Zealand, there needs to be an active effort to shift the narrative of the food and fibre industry. There is currently a rural urban divide in New Zealand. While there are debates over if this divide is real or perceived, there is no doubt

[17] https://gardentotable.org.nz/

that a lack of connection does exist. This lack of connection is a barrier to rewriting the narrative of farming to one of opportunity and climate action.

We want to see farmers nationally recognised and celebrated for their critical role in our economy. Equally, we want to see the urban public to be seen as allies and supporters for farmers as they transition to sustainable farming. Building relationships of respect and compassion between urban and rural populations will help build a new narrative for agriculture.

This new narrative will have to be built through multiple avenues. Increasing awareness can increase understanding across urban and rural groups. However, the media is another major influencer in determining these narratives of farming and climate change.

Currently many media narratives are based around scandals - they are guided by what stories make click bait headlines and receive the highest readership. This can act to alienate farmers and perpetuate negative reputations of the industry which disguises (and even further discourages) the positive actions that some actors in the industry are taking to be sustainable. It is important that negative aspects of the industry are made public as transparency is essential. However, positive stories must be highlighted to balance out the overall farming narrative that is shared with the public. Doing so can build better connections and foster this compassion and respect between urban and rural populations.

What would this look like in reality?

- Media campaigns are balanced: identify the issues in agriculture, but also highlight the current action and the opportunity of New Zealand farming/the opportunity for farmers to be heroes in regard to ecological crises and climate change.
- Retailers and buyers should be increasingly educated on the importance of climate change, farming & food systems.

3. Supporting farmer transitions: Accessible and digestible knowledge

Good education consists of both knowledge and the effective communication of that knowledge. It is critical that the wider New Zealand agricultural industry has access to existing and new knowledge that is being developed, resurfaced and applied to agriculture. But it is equally important that knowledge is communicated in a way which empowers people to change. Creating education pathways that enable agency and ownership of decision-making (whether it be on-farm management, product development, consumer choices etc.) are important to making long term sustainable change.

Too often we hear farmers say there needs to be more research before they will adopt new tech and innovation. However, often the research has already been done, but it remains in academic circles and not in a format that farmers can digest. Even if good quality information is available, unless farmers can make sense of it, it will not be utilised. Research must be made easier for farmers to access and apply. This may mean exploring new and different forms of communication and information exchange channels.

Similarly, knowledge transfer between farmer circles is essential to cultivate and support. Knowledge doesn't just come from academics it's often best gained looking over the neighbours fence. Local sharing of knowledge should be encouraged where healthy and productive. Farmers already share a lot of experience and learnings through their personal networks and supporting them to continue to do this enables them to have autonomy over their learning and uptake of new practices. Farmers require quality education and information to make good decisions but they also deserve to be empowered to successfully adapt. This will ultimately help in the fight against climate change as although science can provide solutions, farmers will be the ones to actually implement changes within farming systems. Agricultural extension agents and science communicators who are paid employees of Crown Research Institutions should be used to distil scientific findings through outreach activities and on a one stop platform for farmers run by He Waka Eke Noa. This central platform will also convey indigenous knowledge where appropriate, and include information on carbon credits for farmers and potential new means of production and land use. We should simultaneously encourage a pathway from school for quality extension and connection services. Specific science extension roles should be developed at CRIs to ensure agents have sufficient time and resources to effectively engage with farmers.

To get knowledge of our cutting edge science to the people, we must champion New Zealand farming research in the media. This can be supported by a database to make agricultural citizen science more available. Farmers must be encouraged to share information readily with each other, particularly within local systems. This is to not only improve production at a local level but to ensure environmental protection is shared through a catchment group of species distribution. We must continue destigmatizing academics and encouraging them to communicate in a clear and concise way. This local sharing of knowledge should be encouraged where healthy and productive. Science conferences are often very formal, we would like a culture where this information sharing is more available to farmers eg. Future Whenua summit. Some science on farming practice is possibly diluted through large companies (EG. fertiliser companies) and farm advisors, or changed based on commercial interests. This should be realised and knowledge sharing in an advisory setting should be non-biased.

What does this look like in reality?

- Supporting Farmer-led education groups, catchment groups and development of on-the ground knowledge to complement industry-led scientific research

- Public, open source platforms are established to provide academic material in accessible and engaging formats. This may include creative communication methods such as comic book style communication, videos, and interactive webpages.
- Science communication methods are embedded into tertiary education programmes in recognition of the role the researchers can have in contributing to accessible and digestible transmission of their work.
- New Zealand farming research and industry groups should employ agricultural extension agents to communicate research in a digestible, and practical manner.
- Farmers, academics, industry and political players in the agriculture industry are well connected and collaboration and engagement between these parties is prioritised in decision-making so that the needs of farmers are supported.

4. Building high quality agricultural career pathways

The future success of the food and fibre sector rests on the ability to attract talented, passionate, and diverse individuals. Increasingly, this will have to come from urban populations who have become disconnected from landscapes. Currently there are no clear career narratives into the primary sector, and in particular, urban youth often don't understand what agriculture is, let alone the myriad of opportunities beyond just farming in supply chain, marketing, agritech, food-science and beyond. This is a problem, as there is no success without succession.

To overcome talent and labour shortages it is critical to construct a sustainable pipeline of talent. Information and education about primary sector pathways must be embedded throughout schooling, including upskilling careers advisors. Those within the sector must also advocate and share stories about the incredible work New Zealand does to inspire the next generation. Notably, the sector must also change and diversify the nature of the roles to make it an attractive place to work and create opportunities for a more culturally and gender diverse workforce.

What would this look like in reality?

- Look for opportunities to bring job seekers, including beneficiaries, into high-quality agricultural careers.
- Information about the numerous and exciting opportunities in a career in agriculture is provided in urban and rural schools.
- Education through institutions such as Primary ITO is supported to ensure farmers are equipped to meet the challenges of their increasingly complex roles.
- The New Zealand agricultural narrative is rewritten to inspire young people from rural and urban backgrounds to join the sector.

Key recommendations

Our initial key recommendations for how to reach this vision for knowledge and education are:

- Government implements a nationwide agriculture and food system education programme into schools.
- Public, open-source platforms are established to provide academic material regarding land use options, climate change, and other relevant opportunities in accessible and engaging formats.
- Create a ‘Regenerative’ media platform, which is solutions-focused and addresses how, what and why change is needed.

Farm management

The Issue

Combatting the climate and biodiversity crisis will require us to change all aspects of farm management. We have to look at what we are putting into the air, soil and water and reassess our relationship with these elements. We must utilise our land so that we maximise production while also optimising the support we can return to ecosystem services. The way to answer these questions is through science, mātauranga, innovation and reassessing what a successful farming landscape looks like.

Key topics of national contention are discussed here as they have direct implications for regulation on farms. Adapting regulation and culture around a new face of farm management will not only help farmers keep ahead of regulation, but it will ensure New Zealand aligns with global consumer trends so that we can command an increasing premium for our products. Farm Environment Plans (FEPs) will be a key part of farming management in the future. Every farmer should have a FEP by the end of 2024 that includes a purpose statement which aligns with the increasingly ambitious environmental regulatory framework discussed in this document. The regulation of farm management needs balanced community and national consensus and must be ambitious at the same time.

The Vision

1. Strengthening water regulation in the face of a national crisis
2. The role of Gene Editing is revisited
3. Winter grazing alternatives in New Zealand's unique coastal climate
4. Regenerative agriculture, the next step
5. Transparent chemical use
6. Continued improvements to animal welfare

1. Strengthening water regulation in the face of a national crisis

New Zealand is undergoing a freshwater crisis which needs urgent attention. Currently, 82% of rivers in pastoral farming land are un-swimmable[18] and 76% of our endemic freshwater fish are threatened with extinction or at risk of becoming threatened [19]. Significant fencing of waterways

[18] https://www.stats.govt.nz/assets/Uploads/New-Zealands-environmental-reporting-series/New-Zealands-environmental-reporting-series-Environment-Aotearoa-2019/Download/environment-aotearoa-summary.pdf
[19] https://www.stats.govt.nz/indicators/extinction-threat-to-indigenous-freshwater-species

is underway on farms across New Zealand, but there is still much to be done. Future farmers support the updated freshwater reforms as the key policy to drive action on water quality in New Zealand. Nitrate limits should be legislated at the regional and catchment level, rather than at the national level. Catchment groups can isolate and track water quality problems to their source. Every farm in New Zealand should be part of a catchment group by 2025, and include water quality management in their FEP. National targets are needed to return New Zealand water quality to pre-settlement levels. In line with the freshwater reforms Nitrate in freshwater should be limited to no more than 1mg/L and a limit of 190kg N/ha applied nationwide on any farm system[20]. Water quality is not just determined by nitrate levels but is also linked to various indicators of water system health such as phosphate and sedimentation. Real time monitoring of water quality indicators are incredibly important for the future of New Zealand freshwater ecosystems.

What would this look like in reality

- Irrigation technology improves in precision so minimal water is overused.
- Technology to lower the high cost of real time nitrate testing should be encouraged.
- A bottom line should be given for a dissolved nitrogen limit of under 1mg/L for our freshwater.
- Future farmers supports the freshwater reforms and agrees no more than 190kg/ ha of urea should be applied nationwide[21]. However regionally, over time these limits will fall and rates should be administered at the catchment level.

2. Winter grazing alternatives in New Zealand's unique coastal climate

New Zealand food systems are unique globally due to our island climate. Unlike on large continents, New Zealand temperatures do not reach seasonal extremes and maintain a relatively stable temperate climate. For this reason New Zealand has had no need for feedlot systems, or to house animals indoors over winter. However, some parts of New Zealand grow less or no food in winter, and winter crops are needed to feed stock in cooler months. This has been managed well in some cases, but winter grazing is seen as a controversial aspect of farming in New Zealand, as it has contributed to poor water quality and in some cases poor animal welfare. Regulation and science must be used to support farmers in transitioning to alternative winter feeding practices where required.

[20] https://environment.govt.nz/acts-and-regulations/freshwater-implementation-guidance/factsheets-on-policies-and-regulations-in-the-essential-freshwater-package/
[21] ibid

What would this look like in reality?

- Increased funding is provided for research on the cost and yield of multispecies winter crops, and data on this is made accessible.
- Restrictions on winter grazing are practical and ambitious in reducing impact.
- Minimal tillage should be encouraged.
- There should be no calendar deadlines for regrassing.

3. Regenerative agriculture, the next step

Regenerative agriculture (RA) has become extremely topical in the New Zealand farming landscape over the past few years. A large amount of work is being done by research institutes, alongside the already thriving regenerative farmer-led groups on the ground to develop this space further. We adopt Pure Advantage's definition of regenerative agriculture, which states:

"[RA is] a set of farming principles and practices that enrich soils, improve watersheds, enhance ecosystem services such as soil carbon and nitrogen sequestration, improve biodiversity, and promote farmer and livestock welfare"[22]

However the broader human elements of RA are vital to understanding the concept. For example, RA is also:

> "the application of an ecological approach to the agricultural landscape with a particular focus on the health of our soil, plants, animals and people, and an expectation of similar or improved profitability. Regenerative farming encourages a mindset of continuous improvement, takes into account that every farm and farmer is different, and recognises the connection between the health of our farms and the health and resilience of our communities, waterways, biodiversity and climate." (Maury Leyland Penno)[23]

Regenerative agriculture is therefore both practice and philosophy and as such is subjective. This is unlike organic farming where a specific set of standards are applied.RA i can be thought about in the same context as conventional agriculture has been in the past - it is a systems approach for a new generation of farming.

[22] https://pureadvantage.org/campaigns/ourregenerativefuturecampaign/
[23] https://ourlandandwater.nz/wp-content/uploads/2021/11/Norton2021_NativeBiodiversity.pdf

What would this look like in reality?

- The uptake of RA becomes part of the necessary transition farming needs to take to be fully balanced with natural ecosystem limits.
- The philosophical act of regeneration on farms should be encouraged and treated separately to robust discussion that must take place around the application of farming practices. Both mindset and on-farm practices are key to transforming New Zealand agriculture.
- Certifications like the Ecological Outcome Verification from Savoury institute are an integral part of the regenerative agriculture journey but are not essential for every farm practising regenerative agriculture, as the benefits from regenerative agriculture go beyond receiving a premium for the product.

4. Reduced chemical use

Overuse and misuse of chemicals on farms can create issues for human and ecological health. For example, urea is the most common fertiliser used in conventional agriculture and has led to yield increase. However, it has also caused damage to our waterways. The benefits and health risks of chemical use (such as glyphosate) are not always clearly communicated.

Supply chains for some chemicals and fertilisers, such as phosphate, are associated with human rights abuses. It is unacceptable to base our industry on the exploitation of people or land. Phosphate is also a finite resource, and the inevitability of peak phosphate must be made widely known to New Zealanders so we can shift to a better system.
As farming in New Zealand transitions to support ecological health and balance, the use of chemicals should err on the side of restraint. Where possible, chemical use should be designed out of farming systems , especially in cases of unethical supply chains or products that are based on finite natural resources.

What would this look like in reality?

- Humanitarian implications of imported phosphate is considered, (e.g. in West Africa) . Fertiliser companies that are the major importers of unethical phosphate acknowledge their role in perpetuating harm and work rapidly towards finding ethical solutions.
- Glyphosate, now a documented carcinogen, should be treated with increased caution and restraint where possible.
- Urea application should be minimised where possible.
- An ongoing conversation is had regarding designing out the use of any chemicals that are associated with human rights abuses or are finite resources.

5. Continued improvements to animal Welfare

Animal welfare is a critical measure of performance on farms and should be maintained to the highest standard. The majority of farmers care deeply about their animals, but animal welfare can be continually improved. Consumers increasingly want proof of high animal welfare standards. It is also in a farmer's best interests to take care of their animals as happy cows and sheep lead to a better yield. It is also important that in our pursuit of a sustainable food future we do not take sentient life for granted.

What would this look like in reality?

- The animal welfare concerns around 'pugging' (cows spending extended time in deep mud) and winter grazing need to be addressed.
- New Zealand should consider a new future for bobby cows.
- A national strategy is developed for planting diverse shelter belts with co-benefits such as biodiversity, food, and timber..
- Respect for animals is upheld throughout the supply chain.
- The disconnect between food and the sentient nature of animals is repaired at the consumption interface.
- Hemp for cattle should not be treated as a drug and regulation of it should be moved from the Ministry of Health to sit with MPI.

Key recommendations

Our initial key recommendations for how to reach this vision for farm management are:

- In line with the freshwater reforms Nitrate in freshwater should be limited to no more than 1mg/L and a limit of 190kg/ha of urea should be applied nationwide.
- Increased funding is provided for research oncost and yield of multispecies winter crops and data is made easily accessible.
- Restrictions on winter grazing are practical and ambitious in reducing impact
- Establish a regenerative agriculture certification programme and encourage the uptake of the wider philosophical principles associated with this approach including continual improvement.
- New Zealand should not participate in the purchase of chemical or other products that are unethical or sustainable in their supply chain.
- The disconnect between food and the sentient nature of animals is repaired at the consumption interface.

Hauora: Holistic wellness

The Issue

As we move into a new era of agriculture, it is critical that we simultaneously shift our approach to health within agriculture. Health and safety has for some time been a strong focus in the industry and is supported by various regulatory requirements and standards. However, a holistic approach to wellness is lacking.

We have seen the rise of a massive mental health crisis in New Zealand, including in agriculture. The predominantly rural nature of the profession means farmers are often isolated, which can perpetuate mental health issues. This has always been an issue, but as the industry continues to come under more reputational and physical pressure due to climate change and market fluctuations, the risk of businesses and therefore people reaching breaking point rises.

The future of farming must put the wellness of ecosystems at its centre. But what is often missed from sustainability thinking is that ecosystems include us. Humans are a key part of a sustainable food future, and therefore human health is critical to this transition. We need a healthy environment to support us, but only healthy people have the capacity to support the environment. Human and environmental health are akin.

Support mechanisms must be developed to address the current mental health crisis.We need a new approach to wellness that prioritises far more than simply health and safety. The Māori concepts of hauora do just this. Te whare tapa whā presents wellbeing as the four walls of a whare. All four dimensions are necessary for us to build a regenerative food future. Below is our vision for what can change to better support the industry to be well.

The Vision

1. Supporting strong mental and emotional health
2. Promoting physical health
3. Building social connections that support health
4. Creating space for spiritual health and mindset development

1. Supporting strong mental and emotional health

Taha hinengaro
Mental and emotional well-being: coherent thinking processes, acknowledging and expressing thoughts and feelings and responding constructively

Developing support structures for mental health in farming is a two step process.. First, immediate support is required to address the high suicide rate in the rural industry. This includes ensuring farmers have access to services such as counsellors and psychologists, which often are not available in rural communities. Financial support for charities such as Will to Live New Zealand and GumbootUp must be increased. We want to see the conversation about mental health continue to become normalised. Farmers must be able to maintain connection with one another as social connection is critical in sustaining mental health. New Zealand rural communities must be supported to create their own mental health and community building strategies so that they can support themselves and each other during tough times.

Secondly, structural changes are needed in the industry to prevent further decline in the mental health of people in the industry.The raft of changes in the farming world will inevitably cause a lot of stress for farmers. The mental health and wellbeing of farmers in what is already a tough industry to work in must be acknowledged by the government. We want to see a proactive approach to this health crisis. Farmers often feel misunderstood and attacked when it comes to climate change narratives. Empowering farmers to be the climate solution and appreciating the hard work they do, will help to support their mental health as we transition to a sustainable food future.

What would this look like in reality?

- Falling incidence of mental health diagnosis in rural communities.
- Infrastructure to support farmers both professionally and socially is enhanced.
- Mental health is included in the health and safety act.
- Increase in mental health funding for rural communities.
- Increase in funding for charities such asWill to Live and Gumboot Up New Zealand.
- Clearer communication regarding legislation changes to decrease uncertainty and the stress this inevitably causes.

2. Promoting physical health

Taha tinana
Physical well-being: the physical body, its growth, development, and ability to move, and ways of caring for it

Healthy balanced lives should be encouraged for the agricultural sector, with good diets, exercise and balance. We strongly support the work of Farmstrong in creating awareness of the connections between mental and physical health and farmers ability to support their business. Farmers have a right to physical health. While there are health and safety acts focussed on reducing physical harm, physical manifestations of mental stress such as burn-out must also be addressed.

Youth also have a leadership role to play in this - it is critical that young farmers coming into the industry are supported to prioritise their health. Youth are essential in building a new system that places individual and community, and environmental health at its core.

When it comes to physical health, the impacts of agriculture extend beyond those working in the industry. Everyone consumes food. The nutrition and quality of produce grown by our farmers impacts the physical health of those who will likely never visit the whenua where food originates.

What would this look like in reality?

- Employers promote staff wellness on farms across New Zealand.
- The 'she'll be right' attitude when it comes to health is replaced by more compassion.
- Farmers have the ability to take time away from the farm when needed for health and respite

3. Building social connections for health and resilience

Taha whānau
Social well-being: family relationships, friendships, and other interpersonal relationships; feelings of belonging, compassion, and caring; and social support

Social connections and relationships are an incredibly important pillar of wellbeing. Social relationships play a key role in farmer health, whether that be with family, friends, h suppliers and producers, the community, or the wider New Zealand public.

Personal support systems are essential, but there is also potential to improve wider industry-public relationships for the benefit of farmer health. We must foster greater connection between farmers and the public. This will help reconfigure the climate change narrative to one of connection and common purpose. Deeper understanding of each other's perceptions and differences will allow farmers to be seen as the allies they are. Relationships between urban and rural groups must be actively supported to ensure our transitions are driven by compassion, authentic communication, and respect.

Similarly, farmers must be supported to utilise their social connections to improve their transition experiences. There is opportunity for cohesion and collaboration within and between farming communities, including sharing of resources and ideas as they adapt to new systems of farming. Transitioning to a regenerative food future is about taking communities with us, and enabling them to be supported and connected as they drive their own future..

What would this look like in reality?

- Emphasise social support structures in funding schemes and within industry to increase social resilience.
    - Support local events, such as summits and field days; potentially using the successful model of the Red Meat Profit Partnership groups.
    - Build platforms for resource sharing, and community asset pools that farmers can utilise to support their transitions.
    - Support farmer-led knowledge sharing where farmers can learn about new farming styles from people they trust within their social networks.
- Food systems are designed with care and compassion - the creation of a ‘caring economy’ for food and agriculture in New Zealand.

4. Creating space for spiritual health and mindset development

Taha wairua

Spiritual well-being: the values and beliefs that determine the way people live, the search for meaning and purpose in life, and personal identity and self-awareness (For some individuals and communities, spiritual well-being is linked to a particular religion; for others, it is not.)

Shifting to a new form of agriculture that is centred on the health of ecosystems is a big change. Some values and beliefs built into the existing agriculture system will be shaken. What it means to be a ‘good farmer’ and to be ‘masculine’ is shifting, as we learn more about sustainability, gender identity, and mental health. These are large topics, and can often challenge existing constructs of what it means to be a farmer. Reconnecting people to Papatūānuku, the land, and

each other is a process that takes time. It also takes a lot of learning and self reflection, and can therefore be confronting and uncertain. It is important that we support farmers through this transition. Rebuilding a positive identity for farming in New Zealand starts at the core of redefining the values and beliefs upon which the system is built. We must create a space for people to shift to a new paradigm of thinking, and ensure they feel supported to take this leap. Farmers need opportunities to openly and honestly engage in these spaces, while being able to feel proud of their land, and the work they do to shift to a regenerative food system.

What would this look like in reality?

- Stigma is removed from conversations about health and spiritual connections to the land and dialogue is transparent and compassionate.
- Clear and accessible pathways of education and support for farmers who want to be good stewards but may not know how to be. Create safe spaces to ask questions.
- Normalise mindset development as a part of sustainability transitions.
- Connect farmers to their values and purpose to empower aligned actions.

Key recommendations

Our initial key recommendations for how to reach this vision of hauora in agriculture are:

- Increased access to professional mental health support in rural communities.
- New Zealand develops a rural mental health specific plan.
- Decision making at government level should be based on the fundamental level of interconnection.
- Invest in building the social capacity of farming communities in health and sustainability related matters.

Supply Chain and Innovation

The Issue

The New Zealand agricultural system focuses heavily on a global export market. We have positioned ourselves as a significant player in the export of dairy products, meat, forestry products, fresh produce, and wine and have established strong global relationships and trade deals.These relationships must be maintained and developed. However, in this time of increasing global instability we must also consider local food security and supply chain resilience. Raw resources are running out, and in many places our infrastructure (for example, ports) are in the process of decay and face accelerating threats from climate change and social disruptions. The global economy is shifting and we have to adapt to ensure New Zealand restructures its own market and material flows.

This is a global issue that has local relevance. New Zealand's agricultural products account for nearly 80% of our exports[24]. Kiwis are proud of this and proud of our farmers who significantly bolster our economy and sell great products to the world. However, there are several signs that our “farm to gate” commodity approach to agriculture has let down farmers and our environment. For example, although New Zealand was largely built on the back of strong wool, today this commodity is mostly burnt or buried by farmers, costing more to shear than it is worth. The global shift to synthetics in carpet and fabric is costing New Zealand sheep farmers and the environment dearly. Putting a price on petroleum fibre sales in New Zealand and building wool processing infrastructure in New Zealand are both ways to fix this.

Our current supply chains are often long, convoluted and fractured, with farmers getting the smallest part of the margin. We must embrace innovative solutions for our economy when it comes to supply and trade within agriculture. Our focus on international markets does assist with global food security and adds value to the New Zealand economy. However, it does not contribute significantly to local food security and can lead to high domestic food prices, making it difficult for some kiwi to put healthy food on their plates. We need to have a conversation on the role New Zealand plays in global food security.

[24]https://www.stuff.co.nz/business/farming/115831996/new-zealands-primary-sector-exports-reach-a-record-464-billion

The Vision

1. Localised supply chains
2. A circular economy
3. Embracing kiwi ingenuity
4. The crucial role of academia
5. Global stories and branding

1. Building local supply chain resilience

Most of our food, fibre, and other manufactured materials are part of globalised supply chains. Raw materials that are produced here in New Zealand are often shipped across the world to be manufactured into consumer goods. Until recently, this globalised flow of goods and services remained mostly invisible - that is, until Covid-19 exposed vulnerabilities. The impacts of climate change and the biodiversity crisis will be far larger. Even at a local level, many of our systems of supply are centralised and therefore vulnerable to even slight disturbances to business-as-usual. To optimise return we must strike a balance between our utilising economies of scale with our export industry, and supplying locally with small scale production techniques.

If the Alpine Fault ruptures or oil supplies become unavailable, most of the New Zealand population will be at risk of going hungry within days or weeks. Our supply chains are complex and lengthy. While it is nearly impossible to plan for a global shutdown of commerce tomorrow, we must reduce supply chain vulnerability where possible. This is a matter of moral responsibility.

Localised supply and production pathways must be developed in New Zealand. Localising food is not about isolationism, but about seeking balance between regional, national, and global systems of trade. Shortening supply chains can also mean higher margins for farmers. Our production systems must prioritise feeding and sheltering Kiwi. Local production can be expensive, so there needs to be a two pronged approach that enables a market for premium products nationally, but also supports a wider agenda of food sovereignty and security in New Zealand[25].No kiwi families should go without access to nutritious, locally grown food. New Zealand farmers must look to achieve both international premiums and embrace streamlined local supply chains.

[25] “Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts the aspirations and needs of those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations.

What would this look like in reality?

- Farmers markets, community gardens, and local butchers all proliferate around New Zealand.
- Access to local food is supported in lower socio-economic areas of New Zealand.
- Local manufacturing is supported and becomes more cost-effective as low-carbon technology improves.
- Creation of regional think tanks to determine the ability of areas to provide food and other essential resources to local communities in times of crisis.
- Investment in food transport and storage systems to enable localised, regional supply.
- New Zealand produce should be accessible in New Zealand at reasonable prices without the use of subsidies.

2. A circular economy

We must adopt a circular economy for agriculture. Currently our system relies on unsustainable and finite resources such as palm kernel, oil, and phosphate. Dependency on these resources is a financial risk as we rely on external supply chains vulnerable to global crises such as Covid. As these resources are finite they cannot support our industry forever. Food waste is a massive problem globally and in New Zealand. due to issues are the consumption and production interface. There must be investment into streamlining waste utilisation across industry. Innovative solutions such as the use of orange peel as silage coverings must be encouraged.

We can replace economic growth with economic efficiency to decouple economic performance from resource demand. Phasing out a linear system by designing out waste products and keeping resources in use for as long as possible can also contribute to lower emissions and less habitat loss. To build circular economy solutions we will need to address our systems flaws with a holistic and cross sectoral approach.

For example, the modern food system runs a large energy deficit and so do most farms. We should consider our claims of farming efficiency not just through the metric of human labour but of pollution and total energy use. This shift in perspective would lead to developing regenerative agricultural systems that aim for higher energy returns with less pollution. Our trend is toward larger and larger farms, yet intensive gardening systems and small farms tend to outperform large farms in yields per area. We could develop land sharing models that could usher in small scale farming without majorly disrupting current ownership structures. We need to hasten reorganisation and push the supply chain into a more sustainable domain.

What would this look like in reality?

- An increasing number of New Zealand farms become zero waste.
- Farmers have access to recycling centres locally and are encouraged to recycle farm waste like effluent, baleage wrap and chemical containers.
- Farms of the future should be encouraged to use materials such as wood, straw, other crop residues, and extracted sugars or oils as we make advances in materials science.
- Industry groups and government collaborate to design a circular economy roadmap to be implemented by 2030. This should include a plan to be prepared for what Oil Free New Zealand will look like and how the industry will navigate this transition.

3. Embracing Kiwi ingenuity

Kiwi ingenuity, number 8 wire mentality and DIY culture all point towards a strong tendency for innovation in New Zealand. Entrepreneurship must be encouraged and supported in the rural sector. Our strong agri-tech scene here needs to broaden and provide more support to early stage grassroots projects. As we take on some major shifts in the way we do agriculture, we must nourish our kiwi ingenuity. The reformation of the outdated Resource Management Act (1991) must be updated based on the principles of this document to ensure kiwi ingenuity is encouraged.Creative solutions from academia, industry, and catchment groups must be encouraged and nourished in the New Zealand agricultural sector.

Plant based foods are increasingly popular globally and present a significant opportunity for New Zealand food systems. A potential growth of $80 billion in revenue has been predicted for plant based food, compared to $23 billion from animal agriculture [26]. Technologies such as precision fermentation are often viewed as a threat to traditional agricultural industries in New Zealand, however could present an opportunity to produce low impact foods, which align with the values of an increasingly environmentally conscious market. Innovative technologies such as these should be considered with an open mind, rather than viewed exclusively as a threat to New Zealand's food sector.

What would this look like in reality?

- The RMA is replaced by 2030 with new legislation based on the principles in this document.
- New Zealand agricultural sectors considered new technologies such as precision fermentation with an open mind.

[26] https://www.mpi.govt.nz/dmsdocument/29147-opportunities-in-plant-based-foods-protein-report

- New Zealand should consider in detail the opportunities for farmers to switch means of production to the increasing opportunities that are coming from the plant based food industry.

4. Global stories and branding

New Zealand is renowned internationally for crafting a premium products . It is important these products are well marketed. Government, cooperatives and farmers can all play a role in improving the way our products are sold to the world. Personal branding to target value added markets should be encouraged for farmers who want to differentiate and demand a premium because of their farming practices. Traceability and storytelling at a national level can also be implemented in farming practice to improve the value of our products nationally and globally. Government must have global advertising budgets for agriculture just as it has for other industries such as tourism.

What would this look like in reality

- Marketing, personal branding, and positive narratives are used to sell our products to the world with a premium.
- New Zealand lives up to our clean green reputation and continues to build on this, lead by a strong food and fibre sector.

5. The Role of Gene Editing is revisited

Although science and technology have changed considerably in the last two decades, gene editing (GE) remains highly contentious in New Zealand. Since the Hazardous Substance Act and New Organisms Act in 2003, New Zealand's laws onGE have not been revisited. Since then, New Zealand has capitalised on the brand reputation of being GE free.

The members of Future Farmers are not unanimously against or in favour of GE, therefore as a non-partisan youth voice, our current stance on this matter reflects that. Future Farmers wishes to be part of the GE conversation in ways that ensure youth perspectives towards GE (in favour, against, or otherwise) are represented. It is important to note that GE is not a 'silver bullet' to fixing New Zealand's agriculture and climate challenges.

What would this look like in reality?

- GE is treated carefully with a dual science and Māori informed approach to discussion;
- A large cost-benefit analysis and detailed research on the possibility of GE in New Zealand agriculture.
- The licensing and sovereignty concerns surrounding GE are addressed.
- The cultural and ethical issues surrounding GE are considered.
- Clear and simple descriptions of GE processes are developed and made accessible to the public.
- Mana whenua are a key part of the GE conversation.
- Inclusive, public consultation on New Zealand's GE policy should be lead by a science based narrative from independent expert group.

Key recommendations

Our initial key recommendations for how to reach this vision for the industry's supply chains and innovation are:

- Wool import tariffs are removed globally.
- Petroleum fibre sales in New Zealand are taxed.
- Bring wool processing infrastructure to New Zealand.
- Government investment and public incentives should be given for circular economy solutions.
- In the case of New Zealand revisiting the GE discussion, the conversation must be informed by the latest science.

Markets and Finance

The Issue

Many farmers carry high loads of debt, which can result in pressure from and control by banks. Innovation is key in addressing climate change. However, with innovation comes risk and the inevitability that some things will not work. For a farmer with already high debt it is difficult to obtain additional funding from banks, particularly if there is no guaranteed return.

Many businesses and individuals want to see emissions from farming drastically reduced. To provide additional funding opportunities, we must establish a system whereby business groups can invest in farms, the way investment in other businesses may occur.
Innovation in New Zealand agriculture should not be slowed down by a lack of capital and equity. A mechanism needs to be in place to fund farmer transitions from conventional to a regenerative systems. This will help lock in carbon alongside future proofing revenue streams, supply chains and inter-generational farm transitions.

The Vision

1. Financing the future of farming
2. Tax rates and pricing
3. Integrated accounting

1. Financing the future of farming

New Zealand agricultural commodity prices have historically been highly variable given our reliance on global markets. When prices are high, industries have expanded without national caps for production regardless of biogeophysical constraints of production. When prices are low farmers and their families have suffered. We must have mechanisms in place to ensure food supply is steady and farmers are financially protected when commodity prices are low. Likewise, when prices in an industry are high, we must have national stocking caps and limit expansion based on what Aotearoa can sustainably provide.

Farmers should be rewarded for practices where they lower eutrophication, sequester carbon and improve biodiversity, and also have to pay for environmental damage. There needs to be greater incentive for farmers to restore and maintain biodiversity on farms. Tokenizing biodiversity or biobanking would see greater value placed on biodiversity and native planting.

Marketplaces for ecosystem services and environmental externalities should therefore be encouraged.

There is relatively good support for agri-tech startups in New Zealand through programme like the Food and Fibre Challenge [27]. However, it is difficult to receive funding for initiatives like local community gardens. Financing meaningful community agricultural initiatives remains a key roadblock in allowing ingenuity to flourish across New Zealand. Additionally, agricultural research grants must foster collaboration, be open to a diverse range of applicants, and produce open source outputs where possible.

What would this look like in reality?

- Novel financing models are developed that enable new forms of investment into on farm innovation and land use transformations.
- Debt is mitigated so it does not prevent transitions to more sustainable farming practices.
- Creation of investment pathways to finance and support uptake of nature-based solutions

2. Tax rates and pricing

Future farmers believe in free trade and therefore support the removal of tariffs. Where externalities exist on harmful imports they should be taxed at the sale. For example a tax on the sale of polluting items like plastic products. The state must integrate all reasonable externalities into market transactions to ensure an efficient economy. By using a ‘psuedo price’ to incorporate externalities into business transaction costs we could eliminate overconsumption of resources. While the limitations of pseudo prices must be acknowledged, this is key in managing the impact of externalities. Even in a free market the government has a significant role to play in pricing externalities, the failure of which has contributed to global environmental catastrophe.

What would this look like in reality?

- The true cost and benefit of externalities from farming must be included in transaction costs where it is reasonable to pseudo price them. Institutional guidance may be needed to transition less efficient farms, and in industries where farms are oversupplied, to new land use. New Zealand should be prepared for a brave conversation on our national stocking rates.

[27] https://auaha.brightidea.com/FFAChallenge2022

- Free trade agreements where they support efficiency increase and healthy competition are to be encouraged.
- Local communities should receive fair value from supply chains.

3. Integrated accounting framework

New Zealand has depleted significant amounts of natural capital to bolster our GDP.While it appears we have become richer with GPD and exports rising, currently we do not account for social and natural capital. Therefore, we cannot know the true value of our country's wealth. Natural capital is finite in size but other stocks , such as social and intellectual capital, are not. To take into account the true value of our country we must measure all capital in New Zealand via the integrated reporting accounting framework [28]. Adopting this framework would incentivise New Zealand to withdraw from finite stocks like natural capital at a sustainable rate. Additionally, value would be placed on restoration of ecosystems as this improves the value of our natural capital. This would also prevent the loss of productive soils to land development in locations such as south Auckland.

What would this look like in reality?

- National integrated accounting framework is adopted to account for natural capital accounts.
- Annual budget reports on natural and social capital measurements such as biodiversity, water quality and climate regulation.

Key recommendations

Our initial key recommendations for how to reach this vision for markets and finance are:

- Alternative funding opportunities are developed to support farmers in transitioning to more sustainable farming practices.
- Financial payments are made available for ecosystem services, carbon sequestration and emission abatement.
- Impact pledges proliferate to fund farm conversions.

[28] https://integratedreporting.org/wp-content/uploads/2021/01/InternationalIntegratedReportingFramework.pdf

- Appropriate markets are developed for externalities, emissions and nitrate which generate liability on farms happen in harmony with those markets that generate revenue (Eg. biodiversity credits).
- National integrated accounting framework is adopted to account for natural capital accounts.