

Novel financing solutions for land use change

Prepared for
**Our Land and Water
National Science Challenge**

Report prepared by
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Executive summary

The Our Land and Water (OLW) National Science Challenge seeks a future where catchments contain mosaics of land uses that are more resilient, healthy, and prosperous than today. To achieve this future land use and land management changes will be required. These changes can be less profitable than existing land uses, require capital investment and be unable to access traditional funding sources. As such, access to finance can be a barrier to some of these environmentally desirable land use or land management changes. Therefore, new and innovative financing solutions – both instruments and participatory models - may be needed in some cases to support these changes.

This project seeks to help farmers and other land stewards identify and pursue innovative financing options that support more resilient, healthy, and prosperous outcomes on New Zealand's whenua. To do this, the project investigated possible options to support land use enhancement (including both land use change and land use management changes) where access to finance is a key barrier. It specifically focuses on land use changes that are environmentally beneficial but may not provide the financial returns desirable for traditional funding routes.

This research focused on idea generation and initial screening. It utilised workshops and discussions with key stakeholders to identify a diverse range of potential financing solutions. It then provides an initial evaluation for each possible option and presents recommendations for further research and development. Possible financing solutions were evaluated and ranked based on their potential to support environmentally beneficial land use and land management change and their need for further research or development, through to those which do not need further action. A solution may be ranked as needing no further action because it is currently functioning well and does not need further development, not because it doesn't support land use change.

Through the project, seventeen financing solutions were discussed and evaluated. Some of these are well established, well-functioning financing solutions for some situations (e.g., debt financing); others are financing solutions that support change but are only environmentally beneficial at the discretion of the parties involved (e.g., privately managed investment companies); some are ideas, but face significant barriers to be more widely utilised (e.g., dividend reinvestment for whenua Māori and peer to peer lending).

One solution stood out as having the most potential, namely creating and monetising new products, primarily biodiversity credits. However, it is incredibly complicated to create well-functioning public markets and there is significant work that needs to be done before this financing solution can realise its potential. There are significant questions to answer in order get this system set up, including whether credits can be sold internationally, what is actually sold and how credits are measured. Existing schemes where environmentally beneficial outcomes have been monetised, namely carbon credits in the Emissions Trading Scheme, have led to some perverse outcomes and scheme design needs careful consideration to avoid any biodiversity credit scheme similarly creating perverse outcomes. Despite this, individual entities are currently using biodiversity credits successfully to fund environmentally beneficial land management in New Zealand, though this is at a small scale.

While this research had hoped to identify a novel financing solution that would support a variety of land use and management changes, it did not. It was clear there was no silver bullet available to fix the challenge of financing land use changes that are environmentally beneficial but either may not provide financial returns desirable for traditional funding routes and/or where traditional financing isn't appropriate (e.g., due to the business structure of whenua Māori). Instead, a variety of mechanisms are

required so landowners can select those that are most suited to their situation and desires (e.g., desire to retain control of their assets or inability to access bank debt etc.). For some contexts a combination of solutions will be most beneficial. For example, using pooled collectives such as catchment groups to combine projects to a significant scale that they are attractive to philanthropic funding sources which are then used to create a self-sustaining endowment fund.

This project also developed evaluation criteria that encompasses the potential considerations for the current and future financing options. These criteria could be utilised at a range of levels, e.g., landowners considering their options, through to researchers and developers assessing possible new financing solutions. Certainty of environmental outcomes and the type and quantum of desirable environmental outcomes were the most important evaluation criteria while how novel a mechanism was ranked as least important.

This project provides a range of recommended actions for the financing options that were ranked highest. To support the financing options discussed, this project also identified a range of enabling factors that should be considered by stakeholders as sitting across the range of financing options. A key recommendation from this work was ensuring that any biodiversity credit discussions are cross-sector (including policy, finance and primary sectors) to ensure market design is suitable for a range of stakeholders. Other recommendations focus on consideration of regulation and potential changes thereof, including to section 30 of the Māori Trustee Act 1953 in relation to dividend reinvestment for whenua Māori, and how non-traditional lenders can loan money more easily within the rules around responsible lending. Connecting suitable parties is a key challenge for a range of financing solutions - a mechanism which can help people identify partners with aligned values and needs would have benefit across financing options. Government funding and philanthropic funds are critical for novel higher risk projects as well as small scale grants. However, grant funding is not certain and groups or landowners relying on this for land use and land management change may need to consider alternative funding options for funding security.

Environmentally beneficial land use and land management changes that are also financially beneficial will likely secure funding through traditional methods. However, where the changes are not profitable, have significant capital costs and/or can't access finance through traditional measures, novel financing solutions may be required. There are some new financing options that are available or could be available with further development that may help support land use and land management changes. While some of these have significant potential, they also require further work to refine or support these solutions. There is not a single novel financing solution that will be suitable for all situations. This work is important as it will help generate conversations about the potential options to finance land use and land management change. Critically, these conversations are important if we want to achieve the vision set out in the OLW National Science Challenge.

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Glossary

Total land use change	Changing the entire farm footprint into an alternative land use. For example, from dairy to horticulture.
Partial land use change	Changing some of the farm to a different land use, but the predominant activity is the same (original) land use. For example, retiring marginal land on a farm to native bush.
Farm infrastructure investment	Changing the drivers of a system to get a better outcome within the same land use, for example building an off-pasture structure.
Land management change	Changing the way a farm system is managed, e.g., using less fertiliser.
Debt financing	Where funding is provided by a third party and offset by a debt liability on a balance sheet that is repaid (often with some kind of interest).
Equity funding	Where funding is typically provided in exchange for some kind of ownership claim (e.g., shares or stock).
Grants	Where the money is gifted, and no ownership or repayment is required.
Economic return	The net benefit/cost to an entity (or society) as a whole.
Financial return	The money made (or lost) on an investment over a period of time.
Risk	Any uncertainty with respect to an investment that has the potential to negatively financial return.
Security	With reference to lending, security is an asset that is pledged by the borrower as protection in case they default on the repayment.
Philanthropy	Philanthropy is the effort an individual or organisation undertakes based on an altruistic desire.
Impact investing	Impact investing is an investment strategy that aims to generate specific beneficial social or environmental effects in addition to financial gains.
Traditional lenders	Typically, first tier lenders (banks) and second tier lenders (building societies and credit unions).

1 Introduction

1.1 Project context

The Our Land and Water (OLW) National Science Challenge seeks a future where catchments contain mosaics of land uses that are more resilient, healthy, and prosperous than today. To achieve this future, land use change and changes in land management will be required. Proposed land use changes may be less profitable than existing land uses or require initial capital investment that makes the change prohibitive. As such, access to finance will be required which can be a barrier to some of these environmentally desirable land use and land management changes. In addition, land use and land management change may be reliant on financial grants; however, these are often an unsustainable and/or uncertain finance source. In these cases, new and innovative financing solutions will be needed to support these changes. This project investigates these potential solutions, which encompass both financial instruments and participatory models, and presents actions for further development and research.

The ultimate outcome of this project is to help farmers and other land stewards to identify and pursue innovative financing options to support more resilient, healthy, and prosperous outcomes on New Zealand's whenua. It will also support planners within regional councils and in central government to consider the implications, timing, feasibility and downstream effects of regulatory decisions. The outputs will also support the investment sectors to encourage greater flexibility when it comes to new models of investment in land use change and identifying potential risks with each of these options.

It is recognised that there are land use and land management changes that are both environmentally and financially beneficial. These changes are often able to access traditional financing options. This project is not focusing on these land use and land management changes, but instead focusing on those options where traditional financing is not accessible. This is typically for changes that are environmentally beneficial but may not be profitable in the long term, unable to access funding for capital investments or cannot access traditional funding (e.g., due to entity structure).

1.2 Project objectives

The purpose of this project is to investigate possible options for financing land use enhancement (including both land use change and land use management changes) where access to capital is a key barrier. It specifically focuses on land use changes that are environmentally beneficial but may not provide the financial returns desirable or necessary for traditional funding routes. It will investigate or explore the connections between the drivers of, and barriers to, land use change and mechanisms for funding land use change solutions. This project aligns with all three of OLW's future state goals. Identifying novel financing options is an enabler to land stewards making decisions that improve te taiao.

1.3 Project scope

It is important to note that land use change and land management changes that are financially and environmentally beneficial are likely to be funded through traditional bank debt. However, that is not to say that the novel financing solutions explored in this report are not equally applicable to these land uses, just that this report focuses on solutions for land use changes that, for a variety of reasons, cannot access this traditional funding option. This could be because more capital is required than a bank is prepared to fund, the land use is likely to be less financially viable, or the land use change is too novel and considered too risky for traditional lenders.

1.4 Project methodology

This project involved three key steps. These were iterative with each key step reinforcing the others and refining the possible outcomes until the final solutions were identified. Throughout this project te ao Māori thinking was used to provide ideas for novel financing solutions as well as to ensure that proposed ideas are suitable in Māori contexts.

1. Initial review and idea generation.

Initially this project drew on existing work, including OLW funded work, to identify obstacles to land use change that could be overcome through novel financing solutions. Following this, novel ideas to overcome these barriers were explored.

To identify novel ideas as well as broader context and challenges in this area, multiple think tank workshops were held as well as one-on-one conversations. Workshop participants were from a wide range of backgrounds to capture diverse ideas, including people from the primary, conservation, financing, and regulation sectors, as well as contributors from areas such as start-ups. To support these workshops the project researchers assessed existing examples, both nationally, internationally, and across a range of sectors (e.g., the conservation sector).

The approaches of whenua Māori owners, land managers and other relevant Māori entities were also explored to identify specific challenges and opportunities as well as potential financing solutions. The potential for mechanisms that offer “relational” (i.e., social outcomes) as opposed to “transactional” (i.e., monetary) investment returns was also explored.

During the idea generation phase the project team sought to identify solutions that were novel. However, funding solutions that were not novel but important to supporting land use change were also discussed in workshops as still being relevant to support land use and land management change.

2. Development of a long list of potential financing solutions

An initial long list of potential financing solutions was created from the idea generation phase. Each of these was assessed against the evaluation criteria. The evaluation criteria were informed by the workshops as well as the researchers expertise. It included criteria such as novelty, accessibility, scalability and the likely financial and environmental returns. More detail on the evaluation criteria can be found in section 5.1.

3. Refinement of a short list of potential financing solutions

This project then refined the long list down to a short list. This drew on the previous two steps as well as further research and investigation. The financing solution options were provided to the workshop participants in a survey format for feedback. The survey asked participants to rank the potential solutions into groups using the following scale:

1. **Prioritise for further action** – is a potential solution with a lot of promise but needs more support; this could be research or development to really make it a viable option for landowners.
2. **Potential solution but faces a big challenge(s)** – is a potential solution but has a big challenge(s) preventing it from being as promising as other options.
3. **Some potential but likely limited benefits** – is a useful solution but is unlikely to be able to be developed much further than its current use.

4. **No further action needed** – the solution is either already well functioning or is not considered a viable option to support land-use change.

To capture and maximise engagement and response in the survey, workshop participants were also invited to provide verbal feedback through 'drop-in' virtual calls.

To support the assessment of potential solutions, the top ranked solutions were assessed at a high level against three examples of need or opportunity for land use change. This helps to ground the potential solution and tease out potential issues in how these may actually be adopted on farm. Three hypothetical examples of land use change were created. One of the case studies is an owner-operated family dairy farm, one is a whenua Māori entity, and one is a family-owned sheep and beef farm. These case studies are described in section 6.4.

2 Background

This section provides background to the research questions posed in this project. It provides specific context to:

- some of the challenges and opportunities facing whenua Māori;
- some of the environmental policy and financial sector thinking that are influencing land use and land management changes; and
- who is lending and how the context of lending finance is changing.

2.1 Māori context

This section provides background to the specific challenges and potential solutions for whenua Māori within the context of this research project. Te Ao Māori, Māori culture and the Māori economy are making important contributions to the New Zealand economy as well as to land use and management change. There is increasing confidence in the environmental and economic spaces that Māori can lead regarding intergenerational, values-led approaches that prioritise collectives and collaboration. This section provides an overview of the idea of a Māori owned bank, the wide range of whenua Māori, hapū, iwi and Māori entities, and the growing confidence across Māori entities in balancing te ao Māori values with economic development.

2.1.1 Māori bank background

A Māori wholly owned bank or capital provider that is developed and designed by Māori, for Māori and with Māori continues to be proposed as an important pathway to improve Māori access to capital. This is not a new idea. In 1886, Kingi Tāwhiao established Te Peeke o Aotearoa at Parawera to demonstrate Māori autonomy. It provided banking services to Māori until about 1905. An example that has been supported strongly in response to the Reserve Bank's recent consultation about access to capital for Māori, is a Canadian Model. That model is delivered by a network of Aboriginal Financial Institutions that received an initial government investment of \$240 million. In the future, this approach could be possible in Aotearoa New Zealand and could include contributions from iwi and post-settlement entities, Māori trusts and incorporations and supported by government as well as private sector third parties interested in supporting Māori enterprise. Particularly for smaller iwi and whenua Māori entities, this concept has merit. Some iwi and Māori entities are currently taking up the option to be banks for their members. Generally, Māori entities have a conservative approach to borrowing. Blair (2021) reported that "the top nine iwi entities had an average of 8% gearing" (debt to equity). An Iwi Investment Report 2021 by TDB Advisory covered nine iwi, three of which had gearing of 10% and above, and six who had gearing of less than 10%¹.

2.1.2 Māori entities and structures

Many types of Māori organisations and entities have responsibilities and obligations for whenua (land), wai (water) and taiao (environment), as well as the collective, intergenerational wellbeing of whānau, hapū, iwi and Māori including:

- Hapū, iwi and marae (more than 130 iwi, 2,100 hapū and 750 marae).

¹ The nine iwi covered in the TDB Advisory report are Ngāi Tahu, Ngāpuhi, Ngāti Awa, Ngāti Pāhauwera, Ngāti Porou, Ngāti Whātua Ōrākei, Raukawa, Tūhoe and Waikato-Tainui.

- Māori trusts, incorporations and reservations, which administer whenua Māori (more than 8,000 governed blocks).
- Post-settlement governance entities (e.g., Waikato-Tainui (\$1.97 billion), Te Rūnanga o Ngai Tahu (\$2.28 billion), Ngāti Whātua Ōrakei (\$1.6 billion), Ngāti Toa (\$811 million), Te Rūnanga o Ngāti Awa (\$174 million), Gibson (2023)).
- Trust boards (e.g., Tūwharetoa Māori Trust Board, Whakatōhea Māori Trust Board).
- Incorporated societies such as Rūnanga, many of which are tribal (Te Rūnanga o Toa Rangatira, Te Rūnanga o Muriwhenua).
- National, pan-tribal or urban authorities (e.g., Manukau Urban Māori Authority).
- Charitable trusts, such as social services and health providers (Te Whānau o Waipareira, Te Puna Ora o Mātaatua).
- Commercial and business operations (e.g., Waiū Dairy, Tainui Group Holdings, Ngāi Tahu Holdings Corporation, Tūaropaki Trust, Miraka Limited, Ōnuku Limited).

This list shows the wide range of structures used by Māori to conduct business. No one size fits all when determining solutions. Rural whenua Māori with productive area up to 24 ha are different to large whenua incorporations. Issues relating to land tenure and utilising whenua Māori as security are less relevant to a Māori small medium enterprise seeking working capital. The nature and history of the whenua, the business type on the land, the stage of development and the scale of development all affect the need for funding support and/or capital.

It is common for Māori-led entities to have multiple relationships with local and national government entities such as district councils, regional councils and the Māori Land Court. Some Māori entities hold statutory acknowledgements through their Treaty settlements, and others have yet to settle their outstanding treaty claims. All have various mana whenua rights and interests, and some settlements are clustered around various sectors, e.g., the CNI Forests Iwi Collective and the Fisheries Settlement.

Many whenua Māori entities have diversified into multiple land uses including horticulture, agriculture, forestry and other land uses. More than 68% of Māori businesses are in the primary sector and therefore many Māori assets are facing land use and management changes. There is growing confidence amongst whenua Māori entities and businesses to align their economic activities to their values. Whenua Māori options analysis often involves Māori values (taonga tuku iho, kaitiakitanga), and legal and economic factors being considered alongside biophysical factors.

2.1.3 Kaitiakitanga and values

Whenua Māori for this report is defined by Te Ture Whenua Māori Act 1993 as being either Māori Customary Land or Māori Freehold Land. Whenua Māori is taonga tuku iho, handed down from ancestors and looked after for future generations. It is owned by collectives who take on the responsibilities and obligations of kaitiaki of the whenua for all beneficiaries. The views, values, and aspirations of kaitiaki and beneficiaries are essential in driving and shaping their decision-making. Tikanga and customary practices continue to be critical considerations for Māori when deciding how to utilise their whenua.

Kaitiakitanga asserts the importance of people as guardians and carers of the mana, tapu, and mauri of the whenua, the wai and the taiao. Inherent in this is the spiritual connection between people and whenua, wai and taiao. Through kinship obligations, kaitiakitanga is concerned with maintaining a balance between the needs of people and the natural world. Kaitiakitanga is often defined to justify the Māori worldview regarding the environment, resource management, and sustainability.

There is a solid and growing base of literature concerning kaitiakitanga as an environmental, sustainability, and productivity ethic, which is derived primarily from whānau, hapū and iwi as well as forums such as the Waitangi Tribunal and legal contexts (Beverland, 2022). Paraninihi ki Waitōtara (PKW) has developed an outcomes pathway called Te Ara Putanga which provides shareholders with a transparent and holistic update on progress. Te Ara Putanga references the values that lie at the heart of the organisation - kaitiakitanga, manaaakitanga, whakapono, kotahitanga and whanaungatanga (Paraninihi ki Waitōtara, 2021, p. 32). In 2021, PKW committed \$5.5 million into two sheep dairy units and invested in the 31-turbine Waipipi Wind Farm.

2.2 Policy context

In this section key policies, frameworks and changes that influence land use change and financing of this change are summarised. Land use change is occurring in a context of established regulatory frameworks and ongoing central and local government policy development. The convergence of a range of policies from central and regional government are pushing landowners towards land uses and land management practices that minimise harm to the environment (encompassing biodiversity, climate, and freshwater). To support landowners to give effect to the intent of these policies and to implement them, some landowners will require financial support. For example, to finance the cost of fencing waterways or to change land uses to meet environmental limits.

In these environmental policy changes, the protection and/or restoration of environmental resources is a key underpinning goal. A lot of these benefits are for the broader public and not monetised for the landowner (or entity) who is making required changes - they are essentially internalising negative environmental externalities. There have been various studies that try to quantify the monetary benefit of these outcomes to communities, and recently we have seen some of these environmental outcomes directly monetised. For example, carbon credits (such as in the NZ Emissions Trading Scheme) or the improvement of water quality through nitrogen trading schemes (e.g., as in Lake Taupō). Providing a monetary benefit for positive environmental outcomes is a pathway to both incentivise change as well as help overcome the financial barriers to land use and land management change.

In addition to the domestic policy context, there is also a broader global context that is driving land use and land management changes. This includes considerations such as consumer preferences for both what landowners are producing and how they are producing it. For example, Fonterra is not just supporting their farmers to meet New Zealand based regulations, but also looking to how they can meet the requirements from their customers such as reporting and reducing their Scope 3 carbon emissions².

2.3 Financial sector context

There are changes in the financing sector that are influencing both how and what land use and land management change is occurring. The rise of climate related disclosures requires entities such as banks to consider such factors in who they are lending to. In addition, policies designed to protect lenders and borrowers are changing how financial loans are provided.

The Sustainable Agriculture Finance Initiative (SAFI) was established by The Aotearoa Circle in 2021 to accelerate further investment and support for sustainable agriculture in New Zealand. The intent is to provide banks and investors with a consistent and clear set of sustainable standards to help inform

² Scope 3 emissions are not produced by a company itself and are not the result of activities from assets owned or controlled by them, but by those that it's indirectly responsible for up and down its value chain.

their lending in the agriculture sector. It uses international frameworks as a starting point and provides a definition or taxonomy (classification system) for good sustainable agriculture practices in New Zealand for use by the finance sector. The Phase One SAFI Guidance covers environmental and social sustainability aspects including climate change, pollution, healthy ecosystems and health and safety. While voluntary, SAFI may help underpin financial lending and investment decisions and push requirements onto landowners to meet new lending criteria when seeking bank funding. Currently, while banks in New Zealand have differences in their requirements for sustainability linked, or green loans, SAFI provides a consistent framework that could be adopted or could help inform individual bank criteria. Independent investors may look to SAFI to help protect their investments given the current sustainability context.

In addition to this, large financial organisations are being encouraged, and in some cases required, to disclose information on their climate related performance and activities. In New Zealand, under the Financial Markets Conduct Act around 200 large financial institutions are required to report climate-related disclosures in accordance with climate standards published by the External Reporting Board (XRB, 2022). Some of the key purposes of this change are to help ensure that the effects of climate change are routinely considered in lending decisions and lead to more efficient allocation of capital.

Similar to climate disclosures, international discussion and demand for Nature-related Financial Disclosures is growing. Like the climate related disclosures, the intent is to encourage large corporate companies and financial institutions to disclose their impact on nature to minimise nature loss. Globally the Taskforce for Nature-related Financial Disclosures³ is leading this work. The relevance of these changes is twofold; the increased pressure for businesses (especially large businesses and investors) to consider their environmental footprint in investment decisions, and the potential changes on who is lending money and to what types of activities.

The Responsible Lending Code and Anti-Money Laundering and Countering Financing of Terrorism Act (2009) have influenced how borrowers access money and how lenders lend money. The Responsible Lending Code elaborates on the lender responsibility principles and provides guidance as to how lenders can comply with the principles. These principles apply not only to loans, but also to credit-related insurance contracts, guarantees and buy-back transactions. The Anti-Money Laundering and Countering Financing of Terrorism Act 2009 came into force on in 2013 (and was updated in 2021). This Act encompasses a very broad range of lenders, including banks, fund managers, financial advice providers, equity crowdfunding platforms and peer-to-peer lenders. The Anti-Money Laundering and Countering Financing of Terrorism Act places a range of obligations on those who must comply, including completing written risk assessments, put in place a compliance programme, prepare annual reports on risk assessment and their compliance programme and submit to independent obligations.

These financial regulations and context factors are important as they have had an impact on who lends money, what they lend money for/to and how easy it is to lend that money. As such, some less traditional lenders are no longer providing lending, or for those who are providing lending it is no more complex to do this lending. This has resulted in it being hard for some people to meet the banks requirements to access lending, therefore restricting access to debt for funding land use and land management changes.

³ <https://framework.tnfd.global/>

3 Barriers to land use change

OLW seeks a future where catchments contain mosaics of land uses that are more resilient, healthy, and prosperous than today. To achieve this future, changes in land use and land management will be required. These changes can be less profitable than existing land uses or require initial capital investment that which provides a barrier to change.

Like most change, land use and land management changes face barriers to adoption. It is important to identify and understand these obstacles to support adoption. Appendix 1 provides information on change theory as well as barriers to change. This section summarises this information to help provide context for why novel financing solutions are required.

Innovation diffusion (where innovation is synonymous with change) is a process encompassing awareness, interest, evaluation, trialling and then adoption. One of the challenges with novel financial solutions is that they often have limited trialability, meaning the evaluation and decision stages become increasingly important and involved. Financial solutions are often challenging to reverse and can have significant business implications if they are not successful. In addition, some of the land use and land management changes required to achieve the OLW vision may be done out of necessity (e.g., to meet regulation) rather than out of interest and desire.

There are four factors that influence the implementation of change (Rogers and Shoemaker, 1971):

- The attributes of the innovation (relative advantage, compatibility, complexity, trialability and observability).
- The characteristics of the individual (e.g., age, education, financial circumstances, goals, family circumstances, support networks, interaction with extension agents).
- The characteristics of the social system (including structure, beliefs, norms and values).
- The channels of communication (including media and interpersonal).

Understanding the characteristics of a possible land use change helps to understand barriers to adoption. For example, relative advantage is the degree to which an innovation is perceived as being better than an alternative innovation or course of action and is often expressed in economic terms (Journeaux, 2009). Research has consistently shown that the perceived financial advantages of environmental innovations are one of the best indicators of their subsequent adoption (Barr and Cary, 2000). Where there is no financial advantage from the environmental change is where the novel financial solutions explored in this research could be used to support positive environmental change.

Trialability and observability can significantly impact land use and land management change adoption. The more divisible into component parts an innovation or change is, the more likely it is to be adopted (Vanclay, 1994). Land use change is particularly difficult to trial in this context. Land use changes that seek improved environmental outcomes are often difficult to observe and attribute to a specific action. For example, when land is retired from grazing and allowed to regenerate this may reduce sediment losses to water ways but this very difficult to observe (by the land user) and may only be detected from water testing results over an extend period.

The land use and land management changes aligned to the OLW vision face financial barriers where they are capital intensive and unlikely to generate additional revenue to cover the cost, or there is a long timeframe before any financial return from the investment. This could include options such as

wetland construction, land retirement and planting or farm infrastructure investment such as off-pasture structures.

Some changes to land use may have high capital cost but provide a positive return on investment. While these changes may be able to secure finance through traditional debt funding or private investment partners, there are some who may be unable to access these funding routes. This could be, for example, because they do not have enough equity or serviceability for banks. Others may need to look for alternative capital funds especially for more risky or unproved capital projects.

Some land use changes are likely to be more effective when implemented across farm boundaries and/or are catchment based. The benefit of these land use changes may be difficult to attribute to individual landowners or even specific groups of landowners. They also are likely to be more challenging to fund and require more complex structures to enable funding, for example trusts requiring administration and governance structures. These collectives do, however, open the door for additional financing options that may not be accessible to an individual, such as philanthropic funds for large scale projects.

Due to these financial barriers to some environmentally beneficial changes, novel financing solutions may be required to support these land use and land management changes. The exceptions to this are where a landowner is in a position where they do not have to worry about the financial impact of changes, or the change will lead to improved financial performance and can access traditional financing.

3.1 Barriers to Māori land use change

Whenua Māori face specific barriers to land use change. There were reported by Coffin (2016) as:

- Most titles do not have a management structure.
- The ownership structure and its administration (with increasing number of shareholders).
- Limited access to investment capital and finance.
- Imposition of Emissions Trading Scheme.
- Ongoing issues with rating of Māori land.
- Compliance and statutory process costs.
- Attracting highly skilled governors and managers.
- Lack of young and well-trained workforce.
- Lack of access to national innovation networks.
- Lack of access to international supply chains.
- Limited interaction with national and international capital markets.
- Limited use of existing regional and national infrastructure.
- Financial literacy.

Fragmentation of shareholdings and the need to consult widely before making investment decisions due to multiple ownership continue to be significant challenges. And most often, access to capital is constrained because the whenua is taonga tuku iho (intergenerational) and should not, or cannot, be sold easily outside of the preferred class of alienees. Access to land can also be very difficult because a large proportion of whenua Māori is landlocked, isolated and marginal (Controller and Auditor-General, 2004).

Limited access to investment capital and finance is of particular relevance to this project and the subject of a research paper conducted by the Reserve Bank of New Zealand (RBNZ), in which the RBNZ Governor, Adrian Orr noted

‘The unique nature of some Māori economic activity put Māori at risk of missing the full benefits of the financial system and carrying unrewarded risk and cost. Negative outcomes could include rising exclusion, inequality, and the degradation of general wellbeing.’

This report summarised issues constraining capital access for Māori businesses into the following themes:

- Limited recognition of the transformative effect successful Māori businesses can have on the wider community.
- Challenges in borrowing against communally held whenua Māori (land).
- Shortage of hard data on Māori businesses and the Māori economy in informing good policy outcomes.
- The growing but still comparatively limited capabilities of Māori firms.
- A lack of scale, coordination and understanding in the Māori business funding system.
- Systemic leadership and decision-making shortcomings in the financial sector.⁴

A report prepared, for Ministry for Primary Industries, by PWC (2014) identified opportunities for increased productivity from Māori land, however, some of this has been constrained due to regulation. Since 2014, Māori entities have increased their investments in forestry and horticulture. In 2021, Statistics New Zealand reported that forest plantation on Māori farms increased from 66,000 ha in 2006 to 110,000 ha in 2016 and continued to increase to 126,000 ha as of 30 June 2020. In this context, one in four hectares of Māori land operated by Māori farms in 2020 was forest plantation (Stats NZ, 2021). In addition, BERL’s Māori in Horticulture Report highlighted that Māori own 5% of New Zealand’s horticulture land (BERL, 2020). The Māori horticulture industry has also quadrupled from 1,000 ha in 2016 to more than 4,000 ha in 2019. Sheep dairying and wind turbines were two of many examples of new whenua Māori investments in 2021.

3.2 Conclusions

Multiple studies have found that economic factors are a significant barrier to the adoption of practices that deliver better environmental outcomes (Journeaux et al., 2017; Coffin, 2016; Barr and Cary, 2000; and Vanclay, 1994). Many sustainable land use practices have characteristics which can be expected to lead to slow and low rates of adoption as they offer limited relative advantage to the landowner, are capital intensive, associated with complex farm system changes, and are difficult to trial or observe.

Māori face additional barriers to land use change compared with non-Māori landowners, largely due to multiplicity of ownership and access to investment capital or finance. While there may be considerable opportunity for improved productivity from whenua Māori, Māori entities are actively balancing values such as whakapapa and kaitiakitanga with economic development and growth to ensure that productivity does not negatively impact environmental outcomes. Where these opportunities are constrained by regulations, some value should be placed on this lost opportunity.

For wider and more rapid adoption of sustainable land use change, where there is little direct value to the landowner or particularly in the case of whenua Māori, the historic or institutional denial of

⁴ Reserve Bank (2022). Improving Māori Access to Capital: Issues Paper. Wellington.

equitable opportunities to increase productivity and improved economic impact, government support and novel financing options are required. These financing options should consider mechanisms that transfer financial value to the landowner so that at least some of the opportunity cost of that land use change is recognised, and lost income partially replaced by some other funding source outside the farm business e.g., neighbours, community, 'social funds'. Conversely there are other views that believe that the cost of internalising the external costs of land use (e.g., negative impacts on water quality) is the responsibility of the landowner. It is important to understand that the cost of internalising negative environmental externalities and the impacts of colonisation on whenua Māori are different issues and so funding to support land use change may look different in these cases.

4 Potential financing solutions to land use change

Table 1 summarises the potential financing solutions that are assessed in this report. Each solution is analysed in more detail in this section.

Table 1: Potential financing solutions to land use change

Financing option	Description
Processor incentives	Financial incentives (e.g., bonus payment) to undertake certain land management actions. Focused on land management rather than land use change.
Debt funding (bank loans) including sustainability linked loans and green loans	Traditional bank funding can fund land use change especially when financially beneficial, not novel and no requirement for this to be environmentally beneficial.
Government and regional council funding	Funding from government and regional councils includes grants, research funds (e.g., SFFF), loans (e.g., PGF) and partnerships. Can cover a range of actions but not particularly novel.
Crowd funding	Funding is generated by raising money from a large number of people who each contribute a relatively small amount, typically pooled for specific projects.
Peer to peer (social lending)	Lending money to individuals or businesses typically through online services that match lenders with borrowers.
Blended finance models	A mix of funding sources for a specific project, which can include Government funds, private investment, impact funds etc. Can be time-consuming to set up.
New products	Developing and selling new, typically non-tangible, products such as biodiversity credits, relatively novel, depending on the product, e.g., carbon credits are less novel, biodiversity credits are more novel.
Value-added products	Developing new products with an environmental 'selling point' e.g., organic direct to consumer milk, to generate additional income to further fund environmental actions.
Philanthropy and impact investment	Investment capital (often provided by high-net-worth individuals) funding investments that are social and/or environmentally beneficial and prioritise these beneficial outcomes over financial returns.
Farm-based listed companies	A publicly listed company investing in rural land, typically focused on financial returns rather than environmental returns. Not very novel.
Private managed investment fund	A managed fund where funds are pooled together with other investors and managed by a central entity. Typically focused on financial returns rather than environmental returns to date.
Endowment fund	A fund, typically managed by a governing body such as a trust that individuals can access money from either as gift or loan. There is a requirement for seed funding to set up a fund and active management to be self-sustaining.
Pooled collectives	A group of entities/people who coalesce around a common benefit, such as economies of scale, shared knowledge or goals, but retain separate ownership of their assets.
Equity partnerships and joint ventures	An equity partnership is essentially a shared ownership of pooled assets. Whereas a joint venture is typically shared ownership (or access to) separate assets. Not particularly novel and hard to scale. Requires parties to value environmental outcomes to provide positive environmental outcomes.
Māori to Māori investment collaborations	One or more Māori entities collaborating to lend capital to another or new entity, typically with a transition over time to repay funding and own assets.
Long term lease development partnership.	A partner finances the development of a new land use venture and after a set time transition, ownership is traditionally handed back.
Dividend reinvestment (whenua Māori)	Instead of paying out dividends to whenua Māori beneficial owners, retaining this for reinvestment in an environmentally friendly land-use or management change. This can be complicated from policy, equity and legal standpoints.

It is recognised that the solutions described in this report do not cover all the potential financing arrangements that individuals and entities may create, and some similar options have been grouped together. Landowners could equally create a combination of these solutions that suit them, for example a pooled collective could utilise philanthropic funds to create an endowment fund to have a sustainable source of capital to support land use and land management change in a particular area.

4.1 Evaluation criteria

Evaluation criteria for the financing options were workshopped with key stakeholders across a series of in-person and online workshops. These options are described in Table 2 below.

Table 2: Evaluation criteria description

Criteria	Description	Key questions
Scalability	This relates to how much finance can be accessed through this funding mechanism and the scope of change this mechanism will support.	Number of farms reached
		Quantum of land use change
		Size of investment
Accessibility	This relates to the amount of rural land and how many investors can access the mechanism and if there are any barriers to specific groups in accessing this solution.	Barriers to access
Returns	This includes both the type of returns (altruistic through to financial) and the quantum of returns. It also includes consideration of who gets the returns.	Who gets returns
		Type of returns
		Size of returns
Desirable outcomes	Does the funding mechanism have potential to create positive environmental outcomes. This includes consideration of the benefits across multiple domains (e.g., water, soil, climate) and generations as well as beyond the environment.	Type of desirable outcome
		Quantum of desirable outcome
		Timeframe to obtain outcomes
Certainty	This relates to the certainty of the desired environmental (or other positive) outcomes. This could include if the outcomes are measurable, auditable etc.	How certain are outcome
		How measurable/auditable outcomes are
Control	This relates to who has control of funds and who has control of the land and associated agribusiness.	Control of land
		Control of funds
Risk/security	What risk do investors and landowners carry, including what security is provided to investors.	Risk to landowner
		Risk to investor
Novelty	How novel is this mechanism, is it currently used or a new idea yet to be tried, new to the sector or NZ.	Novelty to primary sector
		Novelty in all contexts
Perverse outcomes	Is it possible that this mechanism will lead to unintended consequences?	Likelihood of perverse outcomes
Desirability	How desirable is this option likely to be to landowners. Is it desirable to individuals and/or collectives.	Desirability to landowners
		Desirability to collectives or individuals
Complexity	How complex is the mechanism for all involved. This includes how significant the transaction costs are, the required legal and business structures as well as administration and governance requirements.	Complexity for landowners
		Complexity for investors

Survey participants were asked to rank evaluation criteria on a three-point scale, (1) not important, (2) somewhat important and (3) most important. Figure 1 shows the results of this survey analysis, where 100% represents everyone scored this criterion as “most important”.

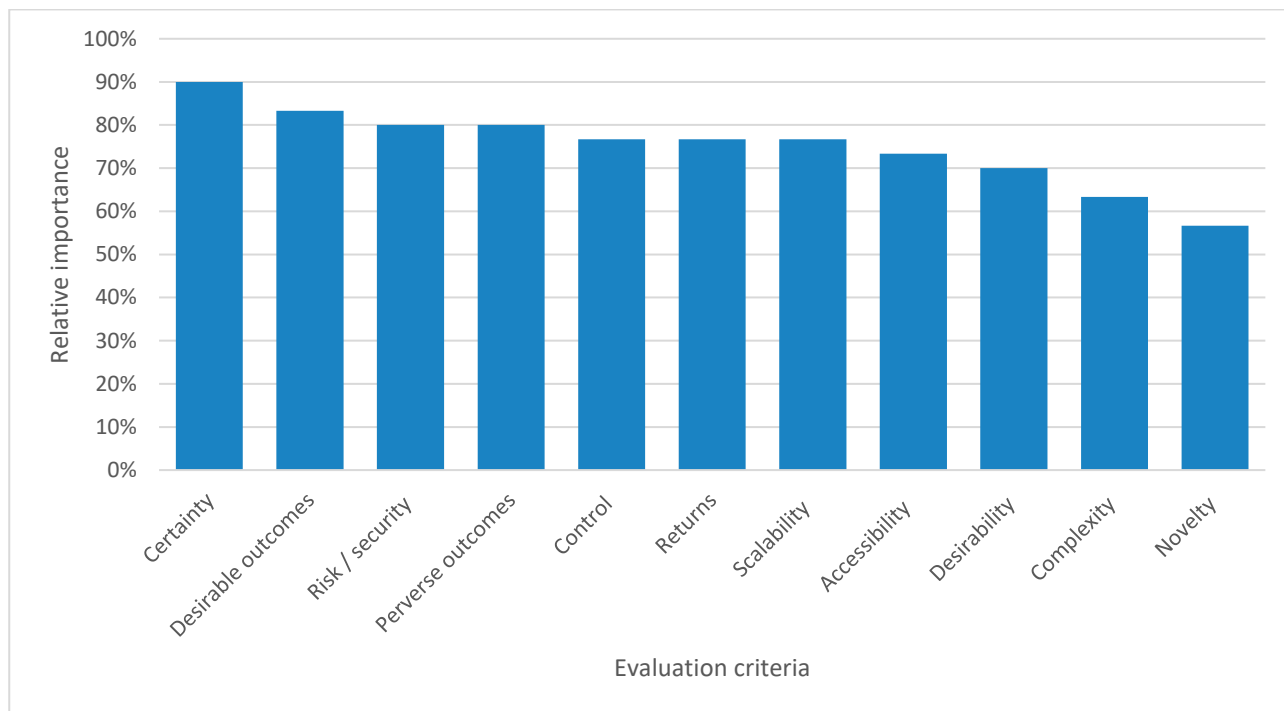


Figure 1: Relative importance of evaluation criteria in survey results

Following stakeholder workshops, the survey, and targeted online feedback sessions, it was clear that certainty of positive environmental benefits, desirable outcomes, control and risk were all considered most important. Other factors such as financial returns and potential for perverse outcomes also ranked highly in ranking decision making. Novelty as a factor for consideration of the financing solutions was largely considered least important.

Criteria that were not included in the evaluation of the financing solutions but were identified by stakeholders as influencing their decision making for ranking of financing options were complimentary (the ability to complement another mechanism (e.g., carbon markets, regulatory reform, adaptation mechanisms)) and practicality for farmers (which was considered similar to desirability).

4.2 New products (e.g., biodiversity credits)

4.2.1 Description

There are a range of potential financial instruments that could be used to support land use or land management change by monetising beneficial environmental outcomes that can then be sold in a marketplace. This has occurred in at a range of scales for various products, for example nitrogen trading in Lake Tāupo, the NZ Emissions Trading Scheme (ETS) as a vehicle to monetise carbon sequestration and private trading of biodiversity credits by Sanctuary Mountain Maungatautari. There was significant desire (expressed in this research) for this financing option to extend into large scale public markets for new products, especially biodiversity credits.

This project does not provide a full review of biodiversity credits, the potential design of a public market and the potential for these markets. Nor does it provide an exhaustive review of existing markets in New Zealand that are supporting land use change (e.g., carbon credits). Instead, it briefly outlines these

concepts and the potential for these to support land use and land management change. Further resources that investigate biodiversity credit markets in more detail include Pollination (2023; 2022), Nature Finance (2023), World Economic Forum (2022), Parata, McCloy and Brash (2023), Aotearoa Circle (2020), Maseyk, Ussher and Christensen (2022) and Toha (2023). In addition, there is currently a review under way on the New Zealand ETS led by the New Zealand Government.

Carbon credits

New Zealand's ETS monetises the environmental benefit of trees sequestering carbon. Units (NZUs) are issued for each tonne of carbon sequestered and can be traded on domestic carbon markets. These NZUs are then ultimately surrendered by entities to offset greenhouse gases that they produce. Forests can be registered with the ETS and earn NZUs for sequestering carbon, and these can then be sold. The prices for NZUs have risen around 50% in the past two years to as high as \$75-\$85 a tonne as the ETS and carbon market have developed. The ETS is currently limited to domestic participants only and the enabling legislation creates demand for the units by requiring non-agricultural emitters to either reduce or offset their emissions. It is, in its entirety, a regulatory construct.

Overall, there have been mixed reviews on the NZ ETS programme. Some feel that due to the policy settings it has over-incentivised the planting of productive farmland into pine plantation forest at the expense of lowering gross emissions. Others feel it has helped convert otherwise marginal land into forestry. There is currently consideration of reforming the carbon market in New Zealand.

Some companies have been working on using the ETS to incentivise native forestry by getting carbon credits on the International Voluntary Carbon Market for pre-1990 forestry, which do not count in the NZ ETS. There are a growing number of businesses that assist organisations to certify projects under the New Zealand ETS and advise on carbon measurement, offsetting services and similar market-based approaches. Some programmes and entities are using carbon credits to establish native forest (e.g., The Nature Carbon Programme).

While the use of carbon credits (from plantation forestry) for private financial benefit is well utilised, there are also examples of projects that are using these more specifically for environmentally beneficial land use change. Some examples of this are:

- **Rameka Forest Carbon Project** is focused on restoring and protecting 91 ha of marginal farmland at the top of the South Island. This initially started on private land, and then through crowd funding purchased an additional neighboring property. The native bush has been restored and is protected by a QEII covenant. The Rameka Forest Carbon Project is being undertaken under the Permanent Forest Sink Initiative - a subset of the New Zealand ETS. Once the NZUs are sold to a carbon offset buyer, they are cancelled in the New Zealand carbon unit registry, so they cannot be used by (or sold to) anyone else. The revenue from these carbon credits helps to cover costs associated with community development support costs (e.g., mountain bike tracks and improved visitor accommodation), conservation management costs (including administration of the carbon returns as well as weed and pest control), opportunity costs (foregone revenue for the landowner) and measurement, reporting and verification costs required for carbon offset certification.

- **Rarakau Rainforest Conservation Project** is 738 ha of Māori owned tall indigenous rainforest, in western Southland, adjacent to Fiordland National Park. This project protects pre-1990 indigenous forest which is not included in the current ETS rules – and so operates in the international voluntary carbon market sector. It is owned the Rowallan Alton (Māori) Incorporation who have given up the right to harvest timber from their forest in exchange for the opportunity to receive donations from supplying rainforest carbon offsets to businesses and individuals. The offsets are priced to contribute to conservation management and community development at this site. The Rarakau landowners aspire to sustainable land management excellence, running high quality cattle grazing land alongside high quality protected rainforest. Purchasing carbon offsets from this project will support this aspiration. This project was developed between 2008 and 2013 by Carbon Partnership Ltd and Ekos, with funding from Te Puni Kōkiri and Carbon Partnership.

Biodiversity credits

A biodiversity credit involves a private company, a 'buyer', offering a tradeable biodiversity unit as a chance to reward and finance conservation work that contributes to improved biodiversity by a 'supplier'. The credit would hold value on a 'pay for biodiversity' basis where a 'supplier' of the credit is a landowner wanting to engage in actions which enhance biodiversity such as planting natives or restoring wetlands or protecting native flora and fauna. Proceeds from the sale of biodiversity credits would provide the landowner with funds to either offset the reduced income or refund the work to protect the biodiversity. An investor can expect returns from biodiversity credits, either through their financial value (as with carbon credits) and/or through providing environmental offsets or marketing/sales points.

While private trades of biodiversity credits currently exist in New Zealand, there is no large public market. There is a range of ways that a biodiversity credit market could be structured, and these would be the subject of policy development. Considerations include if biodiversity credits could be used as offsets for the loss of biodiversity value or not, who could purchase these credits (i.e., if they can be sold offshore to compensate for reduced exports), what constitutes a credit (including how it is measured and audited) and the long-term impact of who might own and control biodiversity on private New Zealand land. Many stakeholders are having discussions on this within New Zealand. It is important these discussions cross sectors, including policy, landowner and finance.

There is nothing to stop private buyers and sellers organising biodiversity credits themselves. An example is the prototype arrangement of a biodiversity unit sale between conservation group 'seller' Sanctuary Mountain Maungatautari and commercial 'buyer' Profile Group Limited, a parent company of a range of businesses producing aluminum windows and doors. These were predicated on selling units of biodiversity restoration work (rather than actual biodiversity). The cost of a hectare of conservation work was \$603/year and the sale of the biodiversity credits funded approximately 83 ha of work. This transaction was organised by Ekos through its 'Sustainable Development Units Programme' developed with funding support from Trust Waikato, the Wel Energy Trust, and the D.V Bryant Trust. Ekos founder and CEO Dr Sean Weaver said he developed this market-based conservation financing mechanism to unlock a new source of private sector money for conservation (Ekos, 2022). The integrity of this biodiversity market programme is based on an environmental markets quality system, including a standard and methodologies developed by Ekos and validated by environmental auditing firm McHugh & Shaw Ltd. The idea behind this example was not to price nature (which can be problematic) but instead to price the human labour and technology cost to look after nature.

Australia has just introduced a bill (The Nature Repair Bill) to the Federal Parliament that, if enacted, will introduce a voluntary biodiversity market. This would allow eligible landholders to generate tradeable certificates for undertaking projects that enhance or protect biodiversity and to sell these certificates to the private sector or the Government, thereby generating revenue from projects that protect nature. Participation in the market would be voluntary and allow landholders and other eligible persons to generate certificates for projects that protect, manage and restore nature. Holders of certificates would be able to sell them to buyers, providing income to the project proponent(s). Buyers of certificates could be companies or organisations as part of their ESG and sustainability initiatives or potentially project developers who are required to offset the biodiversity impacts of their projects. The final details of the bill would be developed as it progresses through public consultation etc.

Blue carbon credits

Coastal ecosystems can absorb significant carbon but are traditionally excluded from current carbon markets, meaning blue carbon credits are novel internationally. Blue carbon is stored in coastal and marine eco-systems, particularly estuaries and mangroves, but also kelp carbon farming. Blue carbon services are using seaweed to draw down excessive atmospheric carbon dioxide and deep-ocean carbon sequestration promises an opportunity for mitigating climate change. This needs further development before inclusion into a carbon credit market (e.g., the NZ ETS) or into a more formalised biodiversity/nature based credit market. This provides an opportunity for entities who have both land and sea-based enterprises access to some form of biodiversity/carbon credit to support land use and land management change. The Hinemoana Halo Ocean Initiative Collective, an indigenous-led collective, has recently secured \$4 million from international investors, including Blue Future Green, to focus on how guardianship works at an iwi level for the health of the oceans and climate change solutions.

Enabling platforms

New technology solutions (platforms) are being developed in New Zealand where private individuals and organisations can buy environmental outcomes directly from farmers and landowners who want to regenerate Aotearoa New Zealand. Ekos, Calm the Farm (uses the NZ Climate Innovation Market) and the NZ Climate Innovation Market (administered by Toha) are platforms where investors can purchase environmental outcomes. Claims are science-backed or personally verified (e.g., through photographic evidence) environmental outcomes and measurement data. While these all work in slightly different ways the intent is the same, through attracting financial support for environmentally beneficial outcomes on farm. Other platforms such as East Coast Exchange (administered by Toha Foundry) focus on recording and matching up volunteer contributions in a non-financial manner though note that these may be repaid if philanthropic investment is made in the platform.

Internationally, technology is also supporting this type of nature-based credit market (either carbon, biodiversity or other). For example, CarbonABLE is an international platform where international nature-based remediation and protection projects are sold through the use of nature-based Non-Fungible Tokens (NFTs). These NFTs are tangible and linked to specific projects which the investors can track through the CarbonABLE platform. Owners of the NFTs do not own the land or forest, instead they own proof of participation in financing nature-based decarbonisation projects. The project owners are funded in monetary terms and secured with contracts. CarbonABLE trade the carbon credits on the Voluntary Carbon Credit Market.

4.2.2 Evaluation

Table 3 assesses the new products against the evaluation criteria.

Table 3: New products evaluation

Criteria	Evaluation
Scalability	The new products discussed are scalable and have significant potential in New Zealand. Māori entities, with high stakes in whenua, wai, moana and primary industries, will be watching for equity in government legislation and policy developments (e.g., Māori foresters in High Court, June 2023). There is optimism that there is enough money in the private sector, nationally and internationally, to support these new products. An increasing number of businesses want to embed biodiversity into their value chains. A barrier to scalability is the cost of biodiversity monitoring which increases the transaction costs of the investment.
Accessibility	Online, user-friendly, transparent platforms and markets will make this more and more accessible. High capital costs, the assessment process and the bureaucracy can be barriers.
Returns	Financial and environmental returns to landowners. Other social and cultural returns to landowners and communities.
Desirable outcomes	A wide range of international examples and more recent New Zealand examples show that desirable outcomes are likely if there has been excellent planning, measuring and monitoring and/or market design (if public market).
Certainty	New Zealand's approach to biodiversity exchanges has been ad hoc and is immature in comparison to international examples. With the support of audit and measurement standards the use of biodiversity credits can lead to relatively certain land use and land management change.
Complexity	Highly complex however growing number of services and platforms to assist landowners and investors. Offsetting relies on good quality information about the biodiversity values at a site and upon a means to convert that information into a 'currency' that can be traded to ensure equivalence between sites. Need significant policy intervention to create a formal public credit market, which can create its own risks.
Control	This is dependent on the design of the credit, often a landowner will be restricted in control (for example if land is retired into QEII land, or carbon credits are sold and land cannot be cleared without purchasing more credits).
Risk/security	The primary risk around these for investors is around the market price for any product/credit. In addition, greenwashing and the potential measurement and auditability of any credits can be considered a risk.
Novelty	These are not novel as a concept; however, the use of biodiversity credits and blue carbon credits is more novel than carbon. There is significant work going on in regard to these tools internationally and in New Zealand.
Perverse outcomes	These can lead to perverse outcomes based on market design. For example, many see the wholesale change of highly productive farmland to pine plantation forestry a perverse outcome of the NZ ETS.
Desirability	This system appears to be very desirable to many parties, however this will depend on the structure of any biodiversity credit agreement (private) or market design (public).

4.2.3 Summary

New products such as biodiversity credits seem likely to have real potential to encourage landowners to undertake land use and land management change that is environmentally friendly. The carbon credit scheme through the New Zealand ETS has had success at incentivising land use change, although the outcomes of this have been met with mixed reviews. Biodiversity credits are being used at a small private scale in New Zealand. New Zealand does not yet have a public biodiversity credit scheme, although this is currently under investigation by various stakeholders. While these instruments have significant potential, they also have risk. The primary risk is around the design, longevity and credibility of any formal market and the risk of perverse outcomes if the market is not well designed.

4.3 Philanthropy and impact investment

4.3.1 Description

Philanthropy is the effort an individual or organisation undertakes based on an altruistic desire. Wealthy individuals sometimes establish private foundations to facilitate their philanthropic efforts. Philanthropy seeks to address the root cause of social issues and requires a strategic and long-term approach. This is contrasted with charity, which is an emotional impulse to an immediate situation and giving normally occurs in the short term.

For individual philanthropists, the benefit is the satisfaction of knowing they have contributed to the greater good. Corporations that support charitable giving benefit from building a better public image, creating more vital brand awareness, attracting sales and customers and attracting new partners and talent who may be attracted to a company that contributes to charities.

Impact investing is an investment strategy that aims to generate specific beneficial social or environmental effects in addition to financial gains. Impact investments may take the form of numerous asset classes and may result in many specific outcomes. The point of impact investing is to use money and investment capital for positive social results. The key difference to philanthropy is that financial returns can be expected through impact investment, even if it is not the primary goal.

NEXT Foundation is an example of a New Zealand strategic philanthropy fund with a vision to leave a legacy of environmental and educational excellence for the benefit of future generations of New Zealanders. Projects supported by NEXT demonstrate (amongst other things) the potential to be significant in scale and impact. NEXT has made numerous and significant investments into projects seeking to reach Predator Free status including *Taranaki Maunga* – a project restoring the ecological vitality of Taranaki's Mountain, ranges, and islands and *Te Manahuna Aoraki* which is a large-scale conservation project focused on restoring the natural landscapes and threatened species of the upper Mackenzie Basin and Aoraki/ Mt Cook National Park (31,000 ha).

Another example is The Nature Conservancy (TNC). TNC is a very large international impact investor that works in 70 countries, including New Zealand. TNC seeks to tackle accelerated climate change and biodiversity loss. A New Zealand example of TNC investment is the Land for Life Project where TNC is partnering with the Hawke's Bay Regional Council (HBRC) to establish Land for Life: a collaboration between HBRC, TNC, farmers and the farming communities to reduce the region's erosion challenges, address climate change, improve freshwater quality and protect biodiversity. Land for Life's pilot has worked with landowners to develop a farm plan on the initial farm that articulates their vision for their land. Work is underway with the next group of farmers to agree on farm improvements (such as erosion control space planting) and sustainable financing mechanisms.

The attractiveness of land use and land management change projects for philanthropists and impact investors is typically based on scale and significance of impact. This can mean it is hard for small groups, or individuals to access these financing options. However, a key option to help overcome this is to combine projects to something more significant, this could be using pooled collectives such as catchment groups.

4.3.2 Evaluation

Table 4 assesses philanthropy and impact investment against the evaluation criteria.

Table 4: Philanthropy and impact investment evaluation

Criteria	Evaluation
Scalability	Large investment funds with the potential to support large-scale projects.
Accessibility	Unlikely to be accessible to individual landowners. Ideally suited to landowner collectives in collaboration with other organisations including iwi.
Returns	Philanthropists do not require financial returns, whereas impact investors typically want financial returns, even if they are not the primary objective.
Desirable outcomes	Purposeful funding that seeks to address specific issues or capture environmentally beneficial opportunities.
Certainty	Projects are typically supported by science and evidence, and often required to provide reports of delivery to stakeholder and this should improve certainty of outcomes.
Complexity	The purpose and vision of impact investors tend to be ambitious and globally focused. Finding and accessing these funds can be challenging for smaller projects as larger scale, more novel or 'hero' projects are likely easier to sell to philanthropists or impact investors.
Control	Strong governance required in funding proposals.
Risk/security	Highly secure, as often a gift (philanthropy) or low financial returns are expected (impact investment).
Novelty	Some emerging examples. Relatively novel in New Zealand context.
Perverse outcomes	Unlikely given the intent of philanthropy and impact investment.
Desirability	Highly desirable. Needs a 'hero project' or pressing issue.

4.3.3 Summary

There is seemingly an enormous opportunity to use philanthropy as a source of funding for land use change. This is likely to be most applicable to projects that are conservation focused and won't typically provide a financial return, for example restoration and predator control. Given the global visions of impact funders and the scale of investments this source of funding is less likely to be accessible to individual landowners. Pooled collectives such as catchment groups could be an ideal vehicle for combining projects and securing this type of funding.

4.4 Māori to Māori investment collaboration

4.4.1 Description

A desire to demonstrate values-centric, intergenerational, and long-term outcomes continue to drive Māori entities to collaborate to support and invest in/with other Māori entities. Barriers to accessing capital also drive this approach. This financing solution is increasing between and with Māori entities whose values and interests (Māori, commercial, environmental) align. Some are structured as partnerships, some as joint ventures and others as collaborations. In partnerships there can be a sharing of resources coupled with a separate structure to oversee and/or manage the engagement. This financial solution will only have positive environmental outcomes if the investment results in land use of land management change that has a lower environmental footprint than previous.

A joint venture brings together two or more people who want to contribute capital, goods, or services to a single commercial enterprise, for a strategic goal. In a collaboration, each operates independently

and has complete control over the individual resources they bring to the table. Sometimes what starts out as a collaboration becomes a partnership. Investment collaborations have become popular for Māori entities who seek to diversify into new sectors and industries or extend ownership/investment along their supply chain(s). Poutama Trust and Te Tumu Paeroa are well known national organisations that invest, facilitate and support Māori business development, including collaborative investments. Examples of various Māori to Māori investment collaborations include:

- **Wai o Kaha Gold JV Limited Partnership** is an example from the Eastern Bay of Plenty of four hapū entities and eight whenua Māori entities investing in land-use change on two large whenua Māori blocks that were previously dairy and beef units, and now include 20 ha of green kiwifruit orchards. The hapū provided in part or all on their own account Tiriti o Waitangi settlement funds to secure government funding (Kānoa), which in turn provided confidence in the private sector (Seeka) to invest in the kiwifruit developments of whenua Māori, where no banks would traditionally provide capital.
- **The Iwi Collective Partnership (ICP)** is a limited partnership between 19 iwi fishing companies across Aotearoa, who have pooled their fishing quota under the Māori fisheries settlement. This is to achieve economies of scale in commercialising this quota. Iwi/Māori groups who own quota for offshore fisheries, but do not own boats and gear needed to access the fishery, find it more immediately lucrative to use quota as an investment asset than a fishing access right. ICP is an example of iwi/Māori managing quota for capital gain to protect the value of their fisheries grievance settlement asset for future generations. In addition to purchasing more quota, iwi also use revenue from quota leasing to fund social and cultural development initiatives.
- **Māori Investment Limited (MIL)**, also based in the Eastern Bay of Plenty, has a history of 44 whenua Māori blocks amalgamating into one title. Since 2016, MIL has invested in two blueberry entities as well as kiwifruit orchards. MIL's Board are committed to restoring the mana and mauri of Pūtauaki mountain. A pest plant and predator control programme has assisted with the increase in small birds and invertebrates as well as rejuvenation of native plants. The overall aim is to return the mountain back to 100% native flora and fauna. They are also seeking legal personality for Pūtauaki. The investment of MIL enabled the conversion to kiwifruit and environmentally beneficial actions on this land.
- **Matai Pacific** owns 99 ha of kiwifruit in Te Puke. Shareholders, with equal shares, include Te Arawa Group Holdings, Rotomā No. 1 Inc. and Ngāti Awa Group Holdings Limited.
- **Kākano Investment Limited Partnership (Kākano)** was formed through a combination of six iwi organisations, including Ngāti Rangitihi, Ngāti Whakaue Assets and Te Arawa River Iwi Limited Partnership, Ngāti Whare, Raukawa, Te Arawa Group Holdings Limited and Tūwharetoa. Together they have purchased primary sector assets including a stake in forestry (including Kaingaroa Timberlands).

Organisations such as New Zealand Trade and Enterprise (NZTE) and Poutama Trust support iwi-to-iwi, Māori-to-Māori, investment collaboration across a range of sectors including horticulture, housing, alternative dairy, aquaculture, commercial property, and fashion. This enables iwi and Māori entities to drive value beyond their current balance sheet and transfer capability and knowledge back to the iwi/Māori over time. NZTE also promotes on their website that they proudly support Māori to create an iwi-owned and Māori-led venture capital fund.

4.4.2 Evaluation

Table 5 assesses Māori to Māori investment collaboration against the evaluation criteria.

Table 5: Māori to Māori investment collaboration evaluation

Criteria	Evaluation
Scalability	This financing solution is scalable across whenua Māori, hapū, iwi and Māori businesses in positive ways for kaitiakitanga approaches to land use and land management changes. There is also potential for further Māori led impact across New Zealand in land use and management change that benefits all New Zealanders (e.g., MIL and Putauaki maunga).
Accessibility	Māori whakapapa, values and interests are key however there are increasing examples of engagements and arrangements with third parties from the public and private sectors, individuals and/or collectives. Transaction costs can be high.
Returns	In most instances, the financial returns are going to Māori entities, particularly those who are the kaitiaki of the whenua, however third parties are also benefitting. Social, cultural and employment returns are also expectations for wider collectives and communities.
Desirable outcomes	It is likely that these will lead to desirable outcomes, particularly when values, vision and strategy aligns. Long-term relationships and intergenerational outcomes are important.
Certainty	There is certainty that these investment collaborations will have positive environmental benefits. Based on whakapapa, values and interests, there is most often intent and mechanisms by which the entities involved will be held accountable.
Complexity	Because this investment collaboration option can be utilised in a range of ways, it can be simple through to complex to set up and operate. This will depend on the intent and the structure etc. The process can be slow/considered.
Control	A clear aim by the majority is that whenua Māori and other taonga are retains some level of control through governance.
Risk/security	Risk and security are shared across the entities that are investing collaboratively. Some collaborations require blended finance through government support via loans or grants, as well as private capital.
Novelty	Over the past 20 years, these investment collaborations have become more popular and novel in the way in which they formalise structures and leverage.
Perverse outcomes	Governance and management capability and capacity are important. There is potential for perverse outcomes if these key elements are not well planned and organised.
Desirability	There is growing desirability and confidence in this approach.

4.4.3 Summary

Access to capital for whenua Māori entities can be a significant barrier for land use and land management. Māori to Māori investment collaboration provides an opportunity to find partners with the same or similar sets of values that have land and capital that can be bought together for the benefit of all parties. The potential for this financing option is significant however creating the partnerships and ventures can take significant time and require capability in governance structures to ensure appropriate management of ventures. However, if the time is taken to find the right partners and the capability and capacity (and support) is available for good governance then it is highly likely there is positive environmental benefit as well as potential co-benefits such as social and cultural returns.

4.5 Long term lease development partnership

4.5.1 Description

This is a type of investment where an entity focused on development works with someone who has land but no capital for development. In the partnership, the development entity will develop a property with the view to accessing a financial return over a period after which the asset is transferred back to the original landowners. During the development phase, the developer will provide capital and manage

the asset over an agreed period and access all (or some) of the returns provided by this asset. The details around timeframes, exit provisions and share of returns can be agreed between the partners in a variety of ways.

This approach has been popular for whenua Māori in the Eastern Bay of Plenty where lease agreements have been created for the purpose of occupying and developing the land, as kiwifruit orchards, for 25 years. A base rental of per usable hectare plus local authority rates and levies on the leased land is payable each year by quarterly instalments until the production date. The lessee pays the lessor the proceeds from the previous year's harvest by 31 May in the following year.

By 20 June of the harvest year, the lessee advises the lessor of the actual number of trays of kiwifruit packed from the orchard as shown by the records of the packhouse where the fruit is packed. The lessee makes available both the lessee's packhouse records, as well as other records, including financial statements. The lessor's proceeds are calculated as follows:

- Half the monies returned to the orchardist (the lessee) by the post-harvest packing and sales contractor for the fruit of the harvest as calculated when all payments and clawbacks are made and received;
- Less half the orchard costs including the costs of the annual interest payable on the unpaid balance of the development costs, pruning spraying tending and fertilizing, protecting and all good husbandry for the harvest, the costs of the harvest and post-harvest, sales and marketing;
- Less half the property expenses.

Huakiwi Developments Limited Partnerships - Since 2017, Huakiwi has invested in developing high performing whānau enterprises on whenua Māori. It is 50% owned by Te Tumu Paeroa (Office of the Māori Trustee) and 50% by Quayside Holdings Limited. Their principal activities are kiwifruit orchard development and kiwifruit production. The Māori Trustee is also the Responsible Trustee of the Trusts that the Limited Partnership holds operating lease agreements with. The whenua Māori owners, represented by trusts, are referred to as landlords. The landlords lease land to the partnership.

During 2022, construction of kiwifruit orchards was in progress on three whenua Māori blocks and there had been transactions with eight whenua Māori blocks. Huakiwi orchards are built and managed so they can be handed to whenua Māori owners as fully operational high performing businesses at the end of the lease period. The operational partner is Southern Cross Horticulture.

This mechanism has often been used to develop whenua Māori, with improvements effected upon the land by third parties in exchange for long term leases, usually at a significant discount to market rentals. Such agreements can be fraught if poorly drafted and have a lack of oversight, with the owners effectively alienated from their whenua for prolonged periods and little surety that the value of any development is appropriate, fit for purpose or that any rental discount is appropriate for the value of the capital development and the risks borne by each party.

Another example of this type of partnership is Wairakei Estate, where the land is owned by a small family partnership (three families) and the land is leased by Pāmu™ who has undertaken significant development on the land, some of it funded by the owners (conversion to pasture) and some of it funded by Pāmu™ (dairy infrastructure). However, this development has faced controversy as it has helped develop forestry land to dairy which is typically thought of as having a more significant environmental footprint.

4.5.2 Evaluation

Table 6 assesses long term lease development partnerships against the evaluation criteria.

Table 6: Long term lease development partnerships evaluation

Criteria	Evaluation
Scalability	These are bespoke arrangements that are likely to be applicable to only specific farms and development partnership arrangements that are commercially profitable.
Accessibility	The key barrier to access in this financing solution is identifying the right partnership between landowner and development partner. Identifying and securing this partnership will be the biggest barrier to access.
Returns	The returns will go to both the development partner and landowner, but the split and timing of returns will be unique to each situation.
Desirable outcomes	These are likely to be driven by financial returns in order to attract a development partner. Capital development may support environmental outcomes, but only when these are aligned with the economic decisions around development.
Certainty	There is no certainty for outcomes, while the contract can help parties be accountable to each other there is no certainty beyond contract provisions.
Complexity	These are complex to set up and each partnership will require unique contracting arrangements.
Control	This will vary based on the partnership contracts, but the land will eventually be returned to the original landowner.
Risk/security	There is risk to both investor and landowner in this arrangement, contracting agreements will detail how this risk is managed and shared.
Novelty	Not a novel financing method but has capacity to be utilised more.
Perverse outcomes	This can lead to perverse outcomes if financial returns are prioritised over environmental outcomes which are not specified in contracts. Regulation on land development helps to mitigate some risks of land development.
Desirability	The desirability of these will be unique to each situation based on the goals of the relevant investor and landowners and their contracting arrangements.

4.5.3 Summary

These arrangements will be unique to each scenario. There is potentially high desirability and financial and environmental outcomes; however, there is also limited certainty of outcomes as it is down to the arrangements between individual entities. Due to the limited certainty of beneficial environmental outcomes, regulation on land development is required to minimise the risk of perverse environmental outcomes. Accessing the right development partner can be challenging. There is the potential for these to be an important part of the financial barrier to land use change, however, the benefit is also dependent on finding the right partners with aligned values to prioritise environmental outcomes. This financial solution will only have positive environmental outcomes if the investment results in land use of land management change that has a lower environmental footprint than previous.

4.6 Dividend reinvestment (whenua Māori)

4.6.1 Description

Whenua Māori and iwi often have distribution policies that outline how they use their own money and assets, and how they will allocate their commercial and investment returns to pay for dividends, grants, loans, spending and investment. Many whenua Māori Trusts declare annual distributions to owners under a formula contained in their distribution policy. Some whenua Māori entities have agreed with owners to distribute grants as well as, or instead of, dividends to shareholders.

It is not uncommon for blocks to have hundreds of beneficial owners with a wide range of small shareholdings due to succession and fragmentation of shares. Some whenua Māori entities notify minimum dividend payable amounts due to the cost of administration. There is growing consideration about the value in paying out minimal dividends of less than \$50 to most shareholders versus reinvestment in other beneficial activities, including land use or land management change for improvement in environmental outcomes. Decisions about the impact of increasing minimal or small dividends and resulting distribution policies must ensure equity of all shareholders, including missing shareholders.

Unclaimed dividends or distributions must be held by an incorporation or body corporate (including the Māori Trustee) for claims by shareholders. Some reasons why dividends are unclaimed include that the trust or incorporation does not have a current shareholder address or in the case of the deceased shareholder, the trust or incorporation has never been advised of any succession order. Unclaimed dividends are recognised as a non-current liability due to the nature of the missing shareholders and the length of time required to locate a shareholder or their tamariki or mokopuna.

Some whenua Māori entities invest the unclaimed dividend funds to support charitable activities. For example, the Lake Taupō Forest Trust holds their unclaimed dividends in an income portfolio which provides interest income to support the activities of its Charitable Trust. The Lake Taupō Charitable Trust organises community-purposes funding for education, kaumātua assistance and other projects to benefit owners. 'Other projects' could include land use change. Changes in distributions and grants policy require accounting advice and collective decision-making processes. Some examples of other entities that advertise total unclaimed dividends on their websites include Paranihi Ki Waitotara, Wairapa Moana, and Tauwhao Te Ngare Trust.

In addition to individual whenua Māori entities, Te Tumu Paeroa (Office of the Māori Trustee) has also identified an opportunity for the organisation to provide grants and loans for Māori economic development by using unclaimed monies in its Common Fund. Unclaimed money is money that cannot be paid out after taking reasonable steps to identify beneficiaries. Te Tumu Paeroa is projecting that unclaimed money held in the Common Fund will grow from approximately \$28.5 to \$50 million within the next 10-12 years (Te Puni Kokiri, 2022). Te Tumu Paeroa is going through a consultation process to make legislative changes to section 30 of the Māori Trustee Act 1953 to broaden its support services to Māori, and how it operates regarding distributable income. If whenua Māori were able to repurpose their unclaimed dividends this would also free up significant capital for reinvestment. This reinvestment could include environmentally beneficial land use and land management changes. However, the accounting, equity and legislative contexts are current barriers to progressing this funding solution.

The scale of dividend reinvestment is important. Some whenua Māori entities may only have a small amount that could be accessed if regulation allowed. This value of money may be best suited to direct, smaller scale land management options, or smaller investments in the farm, for example riparian planting or small forestry plantings (carbon or native) which may generate a return. Conversely larger whenua Māori entities may have more dividends available and may be able to leverage these into a larger investment. For example, these could be invested, and the annual return used to service a loan for a development such as horticulture.

While this financing solution has been discussed specifically in relation to whenua Māori, dividend reinvestment is equally applicable to other farming entities that pay dividends to shareholders. The intent is the same, where shareholders forgo dividends to enable them to be reinvested in environmentally beneficial actions on farm. However, in this case there are not the same barriers to overcome relative to whenua Māori.

4.6.2 Evaluation

Table 7 assesses dividend reinvestment for whenua Māori against the evaluation criteria.

Table 7: Dividend reinvestment (whenua Māori) evaluation

Criteria	Evaluation
Scalability	This has the potential to support land use and land management change on whenua Māori.
Accessibility	Policy, equity and legislative contexts are barriers for trusts and beneficial owners to access this funding solution easily.
Returns	Whenua Māori would get to utilise their commercial returns for the benefit of their collective as they see fit.
Desirable outcomes	The extent to which desirable environmental outcomes are achieved will be dependent on how the money is spent and the competing priorities for this money.
Certainty	There is no certainty of environmental outcomes, it is dependent on how the money is utilised.
Complexity	The complexity in relation to this option is in the accounting, policy and legislative changes that need to happen to enable this financing solution.
Control	The control of investing the unclaimed dividend funds is already with the Māori entities. Future policy, accounting and legislative changes to distribution policies and unclaimed dividends would provide further potential for whenua Māori and Te Tumu Paeroa to invest in land use and management changes.
Risk/security	The risk and return would be carried by the whenua Māori entity and how they manage their distribution policy.
Novelty	This idea is not novel, it has been discussed in various circles for many years, however, it is novel in its application as it remains a challenge to reinvest unclaimed dividends given the context.
Perverse outcomes	This will be dependent on the governance and leadership of the whenua Māori entity and how the trustees choose to utilise their returns and distribute benefits to their collective.
Desirability	This is a desirable financing solution.

4.6.3 Summary

This is a desirable option to financially enable land use and land management change. However, it is currently largely inaccessible for whenua Māori entities who distribute dividends and Te Tumu Paeroa given the policy, equity and legislative requirements in regard to dividends, grants and unclaimed dividends. This approach will require considerable consultation and multiple owner support for whenua Māori entities and Te Tumu Paeroa. This has the potential to support land use and land management change for whenua Māori, however, it is dependent on the whenua Māori decision makers prioritising environmental outcomes when they decide how best to invest their funds. Environmental outcomes will be weighed up against other priorities such as social outcomes. Environmental regulation on land development does provide a check on investment in land development that may not be environmentally suitable.

4.7 Blended finance

4.7.1 Description

The Organisation for Economic Cooperation and Development (OCED) defines blended finance as the strategic use of development finance (public funds) for the mobilisation of additional finance (private funds) towards sustainable development. Blended finance pools resources from the public sector to de-risk investments and make them more attractive to the private sector. Private investors may avoid certain projects or markets because of specific risks, especially in novel research-based projects.

Blended finance re-balances the risk-reward equation of pioneering investments that wouldn't be able to proceed on strictly commercial terms. For example, a development agency that provides a partial guarantee to an investment fund that lends to selected agricultural businesses in emerging markets that manage for additional social and environmental impact as well as financial performance, to reduce the perceived risk and attract private investment in such a fund (Havemann, 2020).

One of the key challenges with this financing solution is that it typically has high transaction costs associated with research/business/funding applications to access the public funding required for projects of which are often of significant scale. These high transaction costs occur in the application phase for public money but also in identifying and securing private funds, as well as throughout the life of the project when reporting on the use of public funds.

To help reduce transaction costs it would be useful to consider how funding applications are processed and managed. While these need to remain competitive and have significant scrutiny due to the use of public funding, there needs to be a mechanism to 'fail fast' so the sector can minimise these transaction costs. Another way to reduce transaction costs of accessing private funds is for a neutral party, such as the Government, to act as a connector where possible.

These are often relatively novel research projects for public funding which means they may not be able to provide assurances of positive benefits and only a few ideas are likely to be funded at any one time. In addition, while these novel research ideas are incredibly important in providing land use change and land management change solutions, they are likely longer-term solutions and are unlikely to get widespread adoption of new practices in the short term.

An example of this financing solution that is currently underway includes a \$5 million kelp farming project in the Hauraki Gulf. This is funded in part (\$2 million) by a grant from the Sustainable Food and Fiber Futures fund from MPI, Auckland Council (\$1.2 million) with impact investing firm EnviroStrat and additional investors making up the balance. The project has been supported by grants from Ākina, BayTrust, Foundation North, Ports of Auckland and The Tindall Foundation during establishment.

A prominent green fund manager who can invest in these blended finance projects is New Zealand Green Investment Finance (NZGIF). NZGIF is a Crown-owned investment bank established in 2019 to accelerate investment that reduces greenhouse gas emissions. NZGIF invests in projects that reduce New Zealand's greenhouse gas emissions including investments in transport, process heat, agriculture and the built environment. NZGIF is funded by the Government and offers investment on a commercial basis (i.e., not offer grants, subsidies or concessions). They use a range of financial investment options from debt through to equity funding and focus on investments of over \$10 million. While this may be targeted at infrastructure programs bigger than normal in the primary sector, they could help support the blended finance model for ventures that will support the next generation of land use change and land management change solutions.

4.7.2 Evaluation

Table 8 assesses blended finance against the evaluation criteria.

Table 8: Blended finance evaluation

Criteria	Evaluation
Scalability	Large scale, better suited to some form of collective or community initiative of a novel or large scale project.
Accessibility	High transactional costs mean these projects need to be large scale, the instigator needs to be prepared to invest in organizing public funds and identifying and accessing private funds.
Returns	Landowner accesses funding at low cost and hence de-risks the investment. Public sector investment at concessional rates means other investors receive higher returns.
Desirable outcomes	By design this funding option seeks to achieve sustainable development, however it will be dependent on each project's outcomes and methods.
Certainty	If these are novel projects, there may be low certainty of outcomes as by definition they are not yet researched/proven. Potentially strong governance and accountability to measurable outcomes.
Complexity	Highly complex to set up and run.
Control	Those receiving the funding are likely to be required to complete audits and additional reporting.
Risk/security	De-risked by public sector funding.
Novelty	This model of funding is not novel and has been used in a wide range of projects.
Perverse outcomes	Likely to have comprehensive application processes supported by feasibility studies. Low risk of perverse outcomes.
Desirability	Highly desirable but transaction costs are high. Intensive funding application processes and rigorous reporting requirements.

4.7.3 Summary

While this is not a new or novel financing solution, it is an incredibly important part of the funding landscape, especially where the blended finance model helps to de-risk investment into novel research and future solutions. It is likely that this type of funding will suit novel research-based land use change at either a partial or total farm land use change level (for example, developing new products as in Leaft Foods). To improve this financing solution consideration should be given to reducing transaction costs (while maintaining oversight of public funding) and connecting private investors to those with ideas that attract government funding. Consideration should also be given to the role of landowners in the design of the projects and how the project findings will be extended to other landowners during and after the project to ensure the return on investment is maximised.

4.8 Government and regional council funding

4.8.1 Description

There are several Government and regional council funding options available that have been established to support land use change initiatives that align with national and regional goals for sustainable land use or development. These may be in the form of grants for specific land use change or environmental improvement work such as planting or fencing, funding for innovative or novel land use change research, loans for specific sustainable land use initiatives or partnerships with industry to promote growth. It is common for such funding to cover some, but not all, of the initiatives.

Typically grants are awards provided to an individual or collective to support a specific project or initiative provided as a lump sum and do not require repayment. Loans are financial agreements

between the lender (in this case a government department) and an individual or collective, however the borrower agrees to repay the loan according to the agreement. Some examples of current and previous government and regional council funds include (but are not limited to):

- Sustainable Food and Fiber Futures
- One Billion Trees Programme
- The Afforestation Grant Scheme
- Māori Agribusiness Innovation Fund
- Sustainable Land management and Climate Change (SLMACC)
- Jobs for Nature
- The Sustainable Land Management Hill Country Erosion Programme
- The Permanent Forest Sink Initiative
- Waste Minimisation & Plastic Innovation Funds
- Contaminated Sites Remediation Fund
- Environmental Initiatives Funding
- Environmental Grants for land, freshwater or biodiversity

Typically grant or loan funding from government or regional councils are reasonably accessible given the criteria for use of funding is met and reporting requirements adhered to. The returns are provided to the individual or collective that receives the funding and the funding opportunity is generally of low complexity for both the landowner and investor. However, for some funds (especially larger more complex ones) more significant applications are required with a range of partners and this can be out of reach or too complex for some landowners which may limit the accessibility of this financing solution. However, on the other hand, this range of funding is often targeted at groups that may struggle to receive other funding support such as smaller marginalised communities.

Some examples of Government and regional council fund that has supported land use change include:

- **Leaft Foods** have received government funding to launch a new leaf protein concentrate in New Zealand. The project offers desirable outcomes for both the primary sector in New Zealand as well as global markets as a potential plant-based protein to be used in a range of foods. Leaft Foods have not promised any returns for the next 5 years.
- **Kaipara Moana Remediation Programme** received \$100 million in the Jobs for Nature fund administered by Ministry for the Environment. Through the combined efforts of Ngā Maunga Whakahii o Kaipara Development Trust, Te Rūnanga o Ngāti Whātua, Te Uri o Hau Settlement Trust, Northland Regional Council and Auckland Council, the programme has provided an opportunity to test and implement approaches to scale up remediation at pace across a large-scale catchment. This project uses this funding to work with landowners to reduce sediment losses from the farm.
- **Pūniu River Care** is an established marae-based river care group, an incorporated society and a New Zealand registered charity. Established in 2015 by Shannon Te Huia (Ngāti Paretekawa, Ngāti Maniapoto), the foundations were laid and supported by the four marae along the Pūniu Awa, including Mangatoatoa Pā, Rāwhitiroa / Ōwairaka Marae, Aotearoa Marae and Whakamarama Marae. PRC has received funding and ongoing support from the Waikato Regional Council (alongside others such as Waikato River Authority, Ministry for the Environment, Momentum Waikato, Te Puni Kōkiri, Waikato-Tainui, Maniapoto Māori Trust Board, Sustainable Coastlines and Waipā District Council). PRC helps to fence waterways and plant riparian areas and while it receives funding (as above) landowners typically also contribute.

Regional Council can also fund environmental outcomes directly. An example of this is in the Bay of Plenty at the Lake Okaro catchment where the Bay of Plenty Regional Council directly worked with landowners the Birchell's to design and part fund environmental works on their farm. This included fencing and planting riparian areas and a constructed wetland. Environmental works were formalised and permanently protected (covenanted) by an Environmental Programme.

It is likely that these have relatively certain environmental outcomes, except where these are new research ventures. However, there is a limited return for the investor and in this case the Government has competing priorities and so there is no guarantee that the investment capital will be available in the long term. Government funding does change over time, for example the Jobs for Nature Fund is about to finish, and this has meant that funding for some land use and land management changes will no longer be accessible.

An alternative in this type of funding is regional council loans. Previously these loans were used to support adoption of regulated activities such as removing non-compliant wood burning fires. Some councils (e.g., Bay of Plenty Regional Council) provided funding for people to meet this policy requirement where costs were too prohibitive. Funding was repaid through the targeted rates (at low to no interest rates). This model was used where the change was a regulatory requirement and therefore it wouldn't be appropriate for the regional council to fund compliance activities but providing a loan that was repaid helped encourage compliance without misusing public funds. However, this model is no longer easy to implement given the change to the lending requirements and the challenge for regional councils to provide this lending in a compliant way.

This funding can support a range of land use changes, from within the current system including planting riparian areas and partial land use change, as well as planting erosion prone land. On occasion, total farm land use change may be funded, though it is less likely under this funding.

4.8.2 Evaluation

Table 9 assesses the government and regional council funding solution against the evaluation criteria.

Table 9: Government and regional council funding evaluation

Criteria	Evaluation
Scalability	These funds either go to, high risk new ventures (e.g., Leaft Foods) which may make a significant impact on one, or a few farms, to a collective, such as PRC which can then distribute smaller amounts to more landowners, or directly to individual landowners. One consideration is that the funders in this case have competing funding priorities and may not be able to continue these funds indefinitely.
Accessibility	Theoretically anyone can apply for these funding opportunities provided they meeting the funding criteria, however, in reality some groups may find the application process complex and time consuming depending on their expertise in funding applications.
Returns	The funder typically does not receive financial returns in this financing solution. However, they can have high environmental returns such as improving the Kaipara Moana or help create new technologies or land use options in the longer term.
Desirable outcomes	This can create positive environmental outcomes and can create co-benefits. The scale of these will vary based on the project funded.
Certainty	Novel research projects may be less certain, funding for projects such as KMR are likely to be more certain where they are predicated on extending existing proven technologies to more landowners.
Complexity	The funding and reporting criteria can be complex, but this is to support the allocation and accountability for the use of public funds. The transaction costs of applying for funding can be high and funding is not certain.
Control	The landowner will retain control of the land, the funder controls the use of the funds, in line with the funding agreement.
Risk/security	This is low risk.
Novelty	This is not a novel solution.
Perverse outcomes	It is unlikely this will lead to perverse outcomes, although there is a chance in more novel research projects.
Desirability	This is desirable funding as there is no requirement to pay back the funding.

4.8.3 Summary

This is an important funding solution. Funding group projects such as KMR and PRC support multiple landowners to access provided environmental support. Funding high risk novel ventures such as Leaft Foods helps to identify future solutions and land use changes where they are too risky to access traditional funding sources. Such grant schemes are desirable as they have no repayment requirements, however they can have high transaction costs in terms of application requirements and the funds themselves are subject to change as the Government faces competing funding priorities.

It is worth considering how regional councils may be empowered to once again provide loans to help landowners complete environmentally beneficial capital projects. While the Responsible Lending rules have a purpose, investigating how this type of solution could occur within these rules is worthwhile.

4.9 Pooled collectives

4.9.1 Description

Pooled collectives are defined for the purpose of this research as a group of entities/people who coalesce around a common benefit, such as economies of scale, shared knowledge or goals, but retain separate ownership of their assets. There is a spectrum of different types of pooled collectives, from

those with formal umbrella entities, to other more informal collectives who collaborate for a small time or specific project and then disband.

The benefit of this financing solution could occur in a range of mechanisms, for example:

- Through economies of scale, a collective could use their combined scale to access financial benefits such as discounts on trees or fencing materials, thereby lowering the cost of land use and land management change.
- Through shared knowledge, advocacy or investment in aspects such as developing value-added products.
- Through collective investment in mutually beneficial projects such as nature corridors, catchment wetlands etc.
- Through the combination of small environmentally beneficial land use and land management projects into a larger project with a more compelling selling point for accessing further funding, such as through philanthropy.

While it would be common for landowners to retain ownership of their assets (particularly land) they may also use pooled collectives to actively manage these assets. This is the big difference to equity partnerships or joint ventures where assets are often shared in some form.

Typically, pooled collectives are more a mechanism to access other funding solutions (e.g., using catchment groups to access government funding). However, they can also be funding mechanisms in their own right. Examples of pooled collectives include:

- **Movers In Hemp Innovation (MIHI)** is a collaboration of Māori and non-Māori entities seeking to grow the hemp industry in New Zealand. They are a mix of potential investors, growers, researchers, manufacturers, and distributors. Initially co-investors set up MIHI to undertake research and market research into North America for hemp-derived products. MIHI has also received government funding to progress this collaboration. Some of the challenges for MIHI entering into the industry under a cooperative arrangement are learning curve costs, understanding and educating market and consumers, infrastructure investment, regulation, mismatch between demand and supply, product choices and overcoming competitive disadvantages of New Zealand.
- **Te Hiku** is a collective formed by a group of 11 farms owned by various iwi in Northland to gain greater influence through scale for marketing and branding, creating local employment and career development, as well as to gain bargaining power in strategic partnerships with processors.
- **Lake Taupō Forest Trust** owns or administers around 32,000 ha of land on the eastern shores of Lake Taupō for the benefit of owners, of which around 23,000 ha are plantation forest. The Trust owns companies across their whole supply chain and has a charitable trust arm.
- **Enviro Collective** was recently created (2022) and was designed to support three irrigation schemes to provide farm planning environmental services to their shareholders. It is resource sharing entity that provides a cost-recoverable model to the three irrigation schemes who are shareholders as well as having a commercial component to support financial resilience. This model helps support shareholders in the irrigation schemes to access farm planning and environmental advice and support with the aim to ensure compliance with regulation and support improved practices on farm.

Catchment collectives/groups

Some catchment collectives and groups will fall into this financing solution. While catchment groups are incredibly diverse, there are numerous examples of them accessing funding as a collective to support environmentally friendly land use and land management change.

- **Friends of Lake Hayes Group** (an Otago based catchment group) receiving \$1 million of donated funds from a local resident to go towards a specific project, 'Vision Lake Hayes', which aims to minimise nutrients and sediments arriving in Lake Hayes (Reilly, 2022). This funding was utilised on a specific project and was a philanthropic gesture.
- **Hurakia Trust** received nearly \$400,000 from MPI for a three-year work programme alongside 13 whenua Māori entities or agribusinesses to develop te taiao-centric integrated farming practice at a landscape scale within a Te Ao Māori framework.
- **Ellesmere Sustainable Agriculture Incorporated** received \$800,000 from MPI for a three-year project to develop and implement farm plans, meet new requirements, and enhance farming practices across the Ellesmere catchment area.

The biggest challenge for this type of funding solution is that it often relies on the right visionary, motivated leader(s) to be in the right place at the right time to generate the momentum needed to get a group operational and generate benefits. Often these people are volunteers and so the workload can slow action. However, there are also groups like NZ Landcare Trust who are trying to minimise the burden of this for catchment groups and provide help and support in establishment and operation.

4.9.2 Evaluation

Table 10 assesses pooled collectives against the evaluation criteria.

Table 10: Pooled collectives evaluation

Criteria	Evaluation
Scalability	This financing solution is scalable and given the range of ways this model can be applied could support a range of landowners and land use and land management changes. The biggest barrier to scale is a common vision and/or leader to coalesce around.
Accessibility	Being 'accepted' into a social grouping or formal collective entity is the biggest barrier.
Returns	The returns are likely to go to the landowner in most cases, though some may be utilised to fund overhead costs of the collective.
Desirable outcomes	It is likely that these will lead to desirable outcomes, but this will depend on the common vision and purpose around which the collective is formed.
Certainty	There is limited certainty that collectives will have positive environmental benefits unless there is some stated intent and mechanism by which the collective can be held accountable to. This could be in funding application or documents forming the collective.
Complexity	Because this funding option can be utilized in a range of ways, it can be simple through to complex to set up and operate. This will depend on the intent and structure.
Control	Typically, landowners retain control of their land in a collective, though they may choose to share or relinquish management if appropriate to that collective.
Risk/security	Typically, there is no security. Risk depends on the intent and contribution of individuals.
Novelty	These are not novel, but there are a range of examples of how these have been utilized.
Perverse outcomes	This is unlikely as groups tend to form for collective interests.
Desirability	These groups are likely to be very desirable especially if a landowner believes in the intent. They could also be beneficial if an individual can gain benefits at low cost to themselves (e.g., be a 'free rider').

4.9.3 Summary

Typically, pooled collectives are more a mechanism to access other funding solutions (e.g., using catchment groups to access government funding). However, they can also be funding mechanisms in their own right. This financing option is not novel but has contributed to environmental benefits in the past, especially through catchment groups (for example as demonstrated in Reilly, 2022). Pooled collectives have benefits, depending on their set up, around economies of scale, shared funding applications, shared knowledge and capital.

The biggest barrier to this financing solution is the identification and support for a shared idea and generating the required effort from individuals to organize and form a collective. Supporting this helps to relieve the burden (e.g., NZ Landcare Trust, Poutama Trust and Te Puni Kokiri) but more support may be beneficial for different types of collectives. The environmental outcomes of this financing model will depend on two key aspects, one being the vision and intent of the group and the second being how they access financial benefits (e.g., economies of scale, funding applications, or investing in value-add products etc.)

4.10 Endowment fund

4.10.1 Description

An endowment fund is a financial asset, typically held by a non-profit organisation, which contains the capital investments and the related earnings are subsequently leveraged by the non-profit organisation to fund a vision or objective. Well managed, these funds are self-sustaining and can be accessed by individuals or groups to fund environmentally beneficial land use or land management change.

These funds can be self-sustaining in a range of ways, they could be paid as loans, repaid with interest (at more favorable rates than a bank) or the funds could be invested and then the interest from the investments is paid out as grants. The regulations on lending may restrict the loan method being utilised.

This financing option has two key challenges, one is where the initial capital for the fund comes from. This could be provided from a variety of sources, including government grants or philanthropic funding or through a scheme where collectives pay into the initial endowment, and then access the benefits of the aggregated fund. The second challenge is how this fund is managed. For example, some kind of formal entity, likely a non-profit organisation of some design, is likely to be required to manage the fund. This entity may be able to tap into the existing community of catchment groups (catchment collectives and environmental community groups) either individually or through an overarching body such as the New Zealand Landcare Trust. This entity would need formal legal and governance structures in order to be managed successfully and typically has costs to operate that need to be met from the fund before activities can be funded.

The potential benefits of this approach are that a collective group of landowners can combine funds and support others in the catchment and/or collective to achieve environmental outcomes that benefit them all. This could include group projects such as a wetland at the bottom of the catchment or accessing cheaper rates on trees to plant through economies of scale or improve access to funding to support individual actions. A landowner may be able to use the funding they have available to support others, and/or leverage collective funding to access what they need. It would also help de-risk exhausting other funding sources by being self-sustaining. However, it is likely that groups would need support to ensure appropriate management of funds, and this may not be applicable for every group,

additionally it may exist beyond catchment group boundaries at a larger scale to benefit from larger funds.

4.10.2 Evaluation

Table 11 assesses endowment funds against the evaluation criteria.

Table 11: Endowment fund evaluation

Criteria	Evaluation
Scalability	The scale of this will depend on accessing seed funding and how many groups are able to set up the structures required for this model. It is likely that scalability is a key barrier for this financing option unless it is operated with some kind of national level support (e.g., through NZ Landcare Trust).
Accessibility	In order to access this type of model, landowners would need to be part of the entity that administers the endowment fund (unless it is an open application grant).
Returns	No one would be generating financial returns from this model, instead funds generated would be used to keep the fund going and provide further financial support to others.
Desirable outcomes	A fund like this would be established with the intention of providing positive environmental outcomes.
Certainty	If the entity is set up where the endowment fund (and proceeds from this) are required to be spent on environmental outcomes this is likely to be relatively certain.
Complexity	These are relatively complex financing options to set up and maintain.
Control	Landowners would retain control of their assets; the entity would need legal structures to manage the endowment fund as well as contractual arrangements for how grants or loans are managed.
Risk/security	The biggest risk for this financing option is managing the fund appropriately.
Novelty	Self-sustaining endowment funds are not novel but are not widely used to support land use change.
Perverse outcomes	One challenge with this option is the risk for mismanagement of the seed fund. Otherwise, the risk of perverse outcomes seems low.
Desirability	It is unclear how desirable this is for those who we envisage managing the funds, desirability for landowners will depend on where the seed fund comes from and if the money is provided as a loan or a grant.

4.10.3 Summary

Self-sustaining endowment funds are not a novel approach and are regularly used in areas like education grants. However, they are not as widely used in environmental grants. The significant benefit is that they would enable groups to be self-sustaining and no longer reliant on finding and securing grants. They have opportunity and potential benefits however consideration needs to be given to the challenges related to administration, legal and governance structures and where the seed funding comes from. Consideration needs to also be given to how the fund is self-sustaining (loans or through investments). Currently it is likely to only be a grant due to the Responsible Lending requirements. This requires significant investment oversight and management for the groups administering this endowment fund.

4.11 Joint ventures and equity partnerships

4.11.1 Description

An equity partnership is essentially shared ownership of pooled assets, whereas a joint venture is typically shared control of (or access to) separate assets. For example, an equity partnership may combine funds and invest together in land and develop it together, while in a joint venture one party may contribute land and one may contribute the knowledge to develop that land and together they

own an operating entity to share in the collective value that is created. These financing solutions require multiple parties to contribute to the resources such as capital, expertise or other assets to achieve the objective. The main differences relate to ownership, management responsibilities and risk-sharing arrangements which are typically shared equally in an equity partnership and are often more bespoke in a joint venture. Both support land use change by combining capital and tangible and intangible assets that are not available to individuals on their own.

Joint ventures and equity partnerships are typically attractive to investors for the potential higher returns and allowing of shared risk, expertise and existing assets (land and capital). This type of financing option is not novel to the primary sector. Joint ventures and equity partnerships typically range from small one-off investment opportunities to complex arrangements. They can be time bound or have opportunity to scale up over time. Returns are typically shared among the partners based on the partnership agreements. Benefits for these arrangements include pooled capital, share of the risk, leverage specialist skills and/or capital assets and efficiencies of scale.

Typically requiring significant financial investment, the risks to both the landowner and investor (if they are separate) can be high. Risks are likely shared across the landowner and investor depending on the level and type of contribution. These risks can lead to challenges around unequal contributions, misaligned incentives, lack of communication or changes in the external environment leading to different perspectives. Risks can be managed in part through contractual arrangements and values alignment across parties.

Individual farm businesses may be hesitant to follow these types of solutions as they lose some control of their asset, however there are significant upsides when these arrangements work. While these are technically accessible to all a big barrier can be finding the right partners. Partners need to be aligned across values, times, space, desire and means which can be hard to find at the right time. This is an area where some kind of support or intervention may help this opportunity be accessed by more. However, a public forum to help match up opportunities may also mean some people lose their competitive advantage, especially those bringing in new capital.

One of the key issues with this as a mechanism for environmentally beneficial land use change is that these are private arrangements with no requirement or accountability for positive environmental outcomes. While this can be an outcome it is entirely down to the values and objectives of the individuals and entities involved in the arrangement.

These financing solutions can occur at a range of scales. They can be between two individuals for example a farm manager buys in to a farm that has no succession plan. Alternatively, they can be between larger entities such as a large corporate partnering with a landowner to jointly develop land or the partnership between Fonterra and Department of Conservation (DOC) aimed at designing and trialling solutions to improve freshwater ecosystems and encourage sustainable farming in five catchments.

In addition, there are more novel options being developed in this financing option, this includes examples like GO-STOCK which a PGG Wrightson product that essentially means that PGG Wrightson purchases stock for a farming business, the landowner then grazes the stock and frees up capital to be invested elsewhere in the business. The stock can be some or all the landowner's stock, and will be decided on (e.g., age, bree, weight, price etc.) and will sit on PGG Wrightson's balance sheet.

Venture capital has been included in this grouping as it largely acts the same way (in regard to supporting land use and land management changes). Venture capital is a form of private equity

provided to typically new businesses and start-ups. This can be both financial as well as expertise and networks etc. Venture capital is attractive for those who are looking to raise capital without enough credit, collateral or history to access more traditional debt. Venture capital is more common in industry with low start-up requirements (such as technology), despite this, there are an increasing number of venture capital companies aimed at the primary sector, especially in response to the challenges of climate change. Some of these venture capital firms focusing in the primary sector include:

- **Matū** operates venture capital funds that invest in science and deep technology start-ups through a hands-on, active approach. They are New Zealand based.
- **Sprout Agritech** - has been involved in agritech and foodtech startups since 2015 and are based in New Zealand. They run accelerator programmes as well as a forum for investors to invest in the general pool of funds or in specific startups.
- **AgFunder** - is based in Silicon Valley AgFunder is one of the world's most active foodtech and agtech venture capital firms.
- **Tenacious Ventures** - is an Australian based venture capital firm specialising in projects at the intersection of agri-food system transformation and climate solutions.

4.11.2 Evaluation

Table 12 assesses joint ventures and equity partnerships against the evaluation criteria.

Table 12: Joint ventures and equity partnerships evaluation

Criteria	Evaluation
Scalability	This is a scalable model that can support land use change all the way through to incremental land management change.
Accessibility	This is accessible to all landowners, provided they can find the right partners, which is often the most challenging part.
Returns	The returns for this financing model will be dependent on the investment as well as the agreement between the parties.
Desirable outcomes	These arrangements can be born out of a desire for a range of returns, this can include financial as well as environmental outcomes.
Certainty	There is no certainty in the environmental outcomes as they are down to the agreements between the partners.
Complexity	As a concept these are relatively common however, organising each agreement is complex and requires unique arrangements.
Control	Control will likely be transferred in part to those who invest in a business. However, this is dependent on the unique agreements in each partnership.
Risk/security	It is likely that all parties in these agreements carry a share of risk.
Novelty	These are not novel arrangements.
Perverse outcomes	There is no guarantee that these lead to improved environmental outcomes.
Desirability	These are likely to be very desirable for the parties involved.

4.11.3 Summary

Joint venture and equity partnerships are not novel and have potential to support environmentally beneficial land use change. However, one of the big challenges with these models is that they typically require financial returns for the parties involved. They can be designed to prioritise environmental outcomes; however, this is down to the preferences of the parties involved and there is no guarantee. This financial solution will only have positive environmental outcomes if the investment results in land use of land management change that has a lower environmental footprint than previous. Finding the right partners for these arrangements is another big challenge with this solution.

4.12 Peer to peer lending

4.12.1 Description

Peer to peer lending matches borrowers with lenders outside of traditional financing institutions, typically by using an online platform (such as Harmony, which was the first company to receive a peer to peer lending license in New Zealand). Borrowers apply for loans via the platform's website and if they are approved, investors fund the loans, charging an agreed upon interest rate. Investors are attracted by the above market interest rates whereas borrowers are offered lower interest rates than they can obtain from banks and finance companies. Platforms charge a 'matchmaking fee'. Peer to peer lending is regulated by the Financial Markets Authority and there are compliance costs to set up a platform. Currently the platforms in New Zealand offer personal loans only.

The loans are unsecured. To minimise risks to lenders, platforms have their own credit application criteria, and this includes thorough credit checks by third party agencies and affordability tests. The platforms also manage the day-to-day loan repayments and collections process for overdue loans. Bad debt, when a borrower does not repay the loan, is deducted from the lender's investment. This type of lending is targeted at borrowers who are unable to offer security and consequently are unable to access loans through banks and finance companies or if they are unable to get a loan through these organisations the interest rate is very high (unsecured lending). Farm businesses often have a securable asset in land that they use to borrow money from banks at a reasonable interest rate and hence there is not the margin to attract lenders and offer a reduced interest rate to borrowers compared to what they can source from a bank.

To date, this model has not been suitable as a mechanism to fund land use change. However, AgResearch (Wever et al., n.d.) has undertaken research into what would enable a successful peer to peer lending model in agriculture. It would differ from traditional peer to peer platforms instead of focusing on citizen to citizen transactions it would focus on connecting small and medium sized rural businesses (as the borrowers). Their proposed model would connect farmers that are interested in producing more sustainably, to citizens that are interested in investing in sustainable farming practices. This could take the form of selling equity stakes, or as more traditional lending relationships (e.g., as modeled on the banks). Connecting lenders and borrowers in this way would enable lenders to have more choice on what their investments fund, while still accessing a financial return.

A platform/ entity would be critical in this rural peer to peer lending model as it would need to connect lenders and borrowers as well as offer 'hypertransparency'⁵ on what actions the investment is funding as well as performance against targeted metrics (these could be both financial and environmental) to satisfy the lenders and help minimise risk. Theoretically it should help reduce the overheads of traditional banks and therefore help reduce costs. However, it will be riskier as there is less security available. This model would enable investors who are not high net worth individuals to invest in land use and land management change through a rural business focused peer to peer platform. To manage the risk, the platform would need checks and balances on the business applying to be a borrower, there would need to be hypertransparency of actions on farm and some form of convertible debt securities to enable intervention before a business was to default.

A platform such as this rural peer to peer lending model that AgResearch is researching shows promise, especially at connecting non-high net worth individual lenders up with on farm investments.

⁵ Hypertransparency is defined as a digitally-enabled, real-time, and often automated mode of data collection and analysis for management and governance of value chains.

However, it is very early on in development and would need further research and development. A key risk is that the platform needs enough borrowers and lenders to sign up to create a viable product, and the market adoption of a tool such as this is currently unknown.

4.12.2 Evaluation

Table 13 assesses peer to peer lending against the evaluation criteria.

Table 13: Peer to peer lending evaluation

Criteria	Evaluation
Scalability	Peer to peer lending has been around for a while but has not supported land use change so this appears to have limited scalability. However, a platform developed specifically for rural businesses to be borrowers may have more scale if it can be robust enough for investors. This needs more investigation.
Accessibility	The current barrier to access for all is a suitable platform. If a suitable platform existed the barrier would be those who can meet the requirements to be a borrower.
Returns	Investors in a rural focussed platform would expect returns, these would have to be competitive with other investment options. The cost of accessing the investment likely limits the use of the funds to higher returning land use change activities.
Desirable outcomes	The platform would likely enable investment in both non-environmental focussed loans and environmental focussed loans. These may have co-benefits across multiple environment domains (e.g., soil, water, GHG).
Certainty	A rural focussed platform would need to provide certainty that the investment is used how it was intended, this is where hypertransparency becomes important.
Complexity	This has very high complexity, especially in the set up and early stages.
Control	This needs to be worked through, while the landowner would like to retain control of the asset, there needs to be some way of managing security for the investor. This needs more investigation to make sure it works for all parties.
Risk/security	Ass with the control criteria, this needs more investigation to find a method that is amendable to all parties involved.
Novelty	The concept of peer to peer lending is not novel, but a rural focussed platform targeting rural businesses as borrowers would be novel.
Perverse outcomes	If borrowers seek investment in actions that are not environmentally beneficial this could have perverse outcomes. This would need to be identified in the details the borrower has to share with potential investors to support investor decision making.
Desirability	At this stage this is likely not desirable, however, this is likely because it needs further details on how it would actually work.

4.12.3 Summary

Peer to peer lending in New Zealand has not really been widely adopted. A big part of this is the size of the investor (and borrower) pool as well as the risk associated with this model, relative to more 'trusted' (and more highly regulated) traditional banks which hold security over loans. However, there is scope to build on the work AgResearch has done to consider how a peer to peer model that enables borrowing by rural businesses may work as a financing solution. A key part of this would be market research to understand the demand (borrowers) and supply (investor) sides as well as the technical components that would be needed, especially around security and control from a landowner's perspective. None of these seem insurmountable now, but significantly more research would need to be completed.

4.13 Privately managed investment fund

4.13.1 Description

A privately managed investment fund is an investment vehicle that pools money from a group of investors to invest in a range of assets. These funds are typically managed by a professional fund manager responsible for making investment decisions on behalf of the fund's investors. Private investment funds in the agricultural sector are not novel, however they are gaining attention. This growth has been driven by several factors including interest from overseas investors for New Zealand agricultural assets, low interest rates and a desire for investors to diversify their portfolios and invest in real assets. Such funds are also more attractive for overseas investors when the New Zealand Dollar (NZD) is weak relative to their own currency, as windfall gains can be realised by investors leaving their foreign exchange position unhedged and also benefitting from NZD appreciation over the term of their investment.

These typically operate as a fund which gets external capital from investors and then purchases farms and manages these to provide a return for investors. They can also operate as more nuanced options whereby parts of land are acquired, generating capital for environmental improvements on the remainder (e.g., partial sale of some land to forestry). When an investment fund purchases land, it does mean that land is changing hands, displacing existing landowners. There is also no guarantee that these farms are managed in a way that has environmental benefits over previous owners and managers, although funds that fall under the oversight of the Overseas Investment Office typically have to demonstrate environmental improvements as a result of ownership of so called "sensitive land".

There are a number of benefits to private-managed investment funds as a financial solution. The new landowners can typically have improved access to capital for investment in livestock, equipment or land use change. However, there is no guarantee that this will lead to environmentally beneficial outcomes.

There are several risks that farmers should be aware of. Regulatory risks may impact the ability to generate returns from a project, financial risks of borrowing funds may expose farmers to interest rate changes or capital structure change. Market and agricultural commodities may introduce additional risk. Some of the private investment funds are also out of reach of 'everyday' investors, and either require significant investment amounts, existing ownership of the land or joint purchase of land. Some examples of other private investment funds in New Zealand are:

- **MyFarm Investments** is a specialist farm investment company that owns and operates primary sector assets on behalf of investors. MyFarm has an environmental focus that seeks to support sustainable agriculture and land use practices; however, this is at the discretion of the company. In addition, investment is currently focused on wholesale investors with larger investments (e.g., \$10,000). They currently have \$484 million in total current syndicate assets which are structured as limited partnerships.
- **Te Pūia Tāpapa** is an iwi/Māori investment fund, established by 26 iwi and Māori organisations in 2018, who are keen to diversify away from whenua activities. It's a limited partnership. Te Pūia Tāpapa has \$115.5 million available for co-investment in large-scale New Zealand businesses and assets. Their investment purpose is to protect, grow, and diversify the asset base of their whānau consistent with their intergenerational wealth aspirations. Their preferred transaction parameters are \$10-\$40 million invested to secure a 10-50% shareholding; Board representation or input; returns commensurate with risk including an illiquidity premium; and appropriate pre-emptive protections.

- **Forever Farming Syndicate** – is an investment syndicate that was set up to fund the purchase of Mangaohane Station (with others to follow). While this was not successful, the syndicate sought wholesale investors that could invest \$250,000. This was planned to fund the land and buildings, with stock and plant funded through debt. The plan was to continue to farm this station as a sheep and beef farm and ensure it was not converted into pine trees, while still providing a financial return for investors.
- **Tahito Te Tai o Rehua** was initially launched in October 2019 as a wholesale unit trust, managed by Clarity Funds Management Ltd in partnership with Tahito as the investment consultant. Tahito is guided by the Māori ancestral worldview. Tahito focuses on three 'channels' to understand how ESG information improves investor returns, ethics, and sustainability.
- **Lewis Tucker & Co** is an investment banking firm that has purchased farmland or entered into joint ventures with a landowner to manage a forestry portfolio to generate carbon. They have created some novel arrangements around their investments, including purchasing land with owners and then splitting the asset between the parties. This is currently possible with the market drivers for carbon forests which are the focus of two of Lewis Tucker's funds 'Dryland Carbon' and 'Forest Partners'.

The big risk around this type of model is there is no requirement for these investments to support positive environmental outcomes, although an increasing number of these funds have overt ESG outcomes or operate under the principles of ethical investment. While this is often a by-product, it is at the discretion of the company and not guaranteed. In addition, the primary structure of these funds is that they buy land rather than providing an opportunity for existing owners to improve land use outcomes. The Lewis Tucker example is one where this traditional paradigm is being challenged.

4.13.2 Evaluation

Table 14 assesses privately managed investment funds against the evaluation criteria.

Table 14: Privately managed investment fund evaluation

Criteria	Evaluation
Scalability	These are likely to have limited scale given the complexities in set up, and there is no guarantee they will support significant land use improvements.
Accessibility	Often private investment companies required wholesale investors, or high buy ins which can restrict investor access.
Returns	Returns will go to whoever has invested in the companies. Where these investors are offshore, so go the returns.
Desirable outcomes	There is no certainty this solution will lead to environmentally beneficially outcomes; it is at the discretion of the company and its shareholders.
Certainty	There is no requirement beyond regulatory requirements for environmentally beneficial outcomes, however, those that are described by the companies will likely face investor scrutiny to be accurate. Some companies may be specifically environmentally focused e.g., carbon farming or biodiversity farming (if these have a valid market and make a financial return).
Complexity	Standard private investment firms are relatively commonplace. New models that are more novel are more complex initially as they are less well known, but this will likely lessen over time.
Control	Investment firms will displace existing landowners when they purchase land, though new models are arising when wholesale farm sales are not required. It may be harder for investors to withdraw investments than listed companies.
Risk/security	The risk to investors depends on the investment model adopted, and the markets they are investing in. Private investment firms are not governed by the same rules as listed companies.
Novelty	Privately managed investment companies are not novel, though new models are arising where wholesale farm sales are not required and this is more novel.
Perverse outcomes	The environmental and financial performance of the land will be linked to the management of the company as well as the investors. There is no guarantee that these will lead to improved environmental outcomes.
Desirability	These are likely to be undesirable for existing landowners who are displaced but may be very desirable where they get to retain ownership of a majority of land while receiving capital (and/or income) for other portions (e.g., the Lewis Tucker model).

4.13.3 Summary

Private investment companies are not novel, but new models are being created which do not require purchase of whole farms. This model has promise in terms of supporting environmentally beneficial land use change. However, regardless of the model used the big challenge is that these models require financial returns for investors. Where environmental outcomes are aligned with this, they can support environmentally beneficial land use and land management change but there is no guarantee. This is most likely to occur where a lower environmental footprint land use can occur on the land but requires capital development, or where a market exists for environmental products (e.g., the existing carbon market and potential biodiversity market).

4.14 Farm based listed companies

4.14.1 Description

A listed company is a public company that has issued shares of its stock through an exchange, with each share representing a proportion of ownership of the company. A listed farm company focuses on farming assets to provide returns for their shareholders. An example of this model is:

- **New Zealand Rural Land Co (NZRLC)** is a listed company that raises capital for investment in farmland, and then installs various forms of lessees to minimise risk to investors (i.e., through management, commodity prices or weather). Investors have no direct exposure to farmer co-ops, limited exposure to environmental risks and greater liquidity (via the NZX) than syndicates or direct investment. According to their prospectus they have a stringent selection process for their tenant partners, ensuring an ongoing environmentally sustainable performance.

The NZRLC raised \$75 million in an initial public offering and listed on the share market, which together with debt gave it about \$100 million to buy rural land. Its first planned purchase was a 456 ha dairy farm in Mokoreta, for \$10.4 million. It was leased by the Fortuna Group for 10 years for \$515,667 a year (4.97% lease yield after transaction costs).

This model can have benefits for the environment as there is the ability to raise capital more easily and economies of scale to invest in environmentally beneficial land use and land management changes. One downside of this model is that the purchase of land model can displace existing landowners. Another is that there is no certainty that these are more environmentally beneficial than the previous landowners as it is at the discretion of the company (and its shareholders).

4.14.2 Evaluation

Table 15 assesses farm based listed companies against the evaluation criteria.

Table 15: Farm based listed companies evaluation

Criteria	Evaluation
Scalability	Listed companies have access to significant capital through public offerings, theoretically they can purchase multiple farms (as much as capital enables). The quantum of land use change can be significant but is not guaranteed.
Accessibility	Because everyone can access publicly listed companies there are no barriers to be an investor. There are challenges around landowners' accessibility as they will be displaced when land is purchased, but this may open more opportunities for lessees.
Returns	Returns will go to whoever has invested in the listed company as a shareholder.
Desirable outcomes	There is no certainty this solution will lead to environmentally beneficially outcomes; it is at the discretion of the company and its shareholders.
Certainty	There is likely to be relatively certain outcomes in line with what the company says they are doing given the scrutiny of shareholders and public as well as disclosure and reporting requirements for listed companies.
Complexity	Creating a listed company is complex, however it is a known model and therefore there is an understanding of how to set up a company and there are standard operational rules once up and running.
Control	Shareholders control their funds and can withdraw these as desired, providing there is adequate liquidity on the exchange. The listed company owns the land (and could control it or not as desired). The company will displace existing landowners when they purchase land.
Risk/security	The risk to investors depends on the model adopted, a model only focused on landownership will be less risky than that which is subject to farm operational risk. As a listed company, the company is subjected to the relevant rules (e.g., NZX rules).
Novelty	Listed companies are not novel, though ones that focus on rural landownership are not common in New Zealand.
Perverse outcomes	The environmental and financial performance of the land will be linked to the management of the company (and the lessees they select) as well as the shareholders. There is no guarantee that these lead to improved environmental outcomes.
Desirability	These are likely to be undesirable for existing landowners who are displaced.

4.14.3 Summary

Listed companies can generate capital which can be used to fund environmentally beneficial land use and land management change. However, there is no specific requirement for these to be more environmentally friendly than the previous landowner which is displaced by the listed company purchasing the asset. Often shareholder pressure and a desire to attract new shareholders will incentivise a listed company to adopt environmentally beneficial practices, but this is not certain. Listed companies are not novel but can be hard to scale due to significant transaction costs.

4.15 Processor incentives

4.15.1 Description

There are a range of financial incentives provided by processors for primary producers to undertake specific actions on farm. These actions typically include environmentally and socially desirable practices such as having and implementing farm environment plans, improving emissions intensity or demonstrating improved employment outcomes. Incentive payments from processors support land management change rather than land use change as they incentivize practices within a given land use. There is no benefit for processors to provide an incentive for land use change that means a farm business will no longer supply the processor. There may be some processor incentives that support partial land use change, such as retiring marginal land.

Actions incentivised by processors differ across processors and are often linked to rules and regulations in New Zealand, societal pressures and perceived or explicit consumer demands. These schemes are purely at the discretion of the processors. As such the processor can also change the KPIs associated with the incentive schemes. These incentives can take the form of extra payment per unit of product or a reduction of payment if criteria are not met. Often these schemes include some level of independent auditing, although this varies. These schemes are typically well developed with minimal complexity and ease of access for all. There is often support from the processors to access these processor incentives through field staff. Processor incentive schemes include (but are not limited to):

- The Co-operative Difference – Fonterra
- Te Ara Miraka – Miraka
- Lead with Pride – Synlait
- NZFAP and NZFAP Plus – NZ Farm Assurance Incorporated (covers most red meat processors)
- NZGAP, NZGAP+EMS and GlobalG.A.P - HorticultureNZ

The challenge with processor incentives is that they are typically going to incentivise incremental, although good, change and outcomes. They are likely to encourage positive change within the bounds of the criteria decided by the processors, but they are unlikely to be enough of a financial incentive to drive significant changes within a farming system (e.g., building on farm infrastructure) and won't support total farm land use change that reduces product supply. They also do not provide financial support upfront in a change, as they are typically accessed once a particular behavior is implemented.

4.15.2 Evaluation

Table 16 assesses the processor incentives against the evaluation criteria.

Table 16: Processor incentives evaluation

Criteria	Evaluation
Scalability	This solution can be scaled to all who supply a processor with such a scheme, which includes most major processors.
Accessibility	The key barrier to access for this is being able to achieve the requirements that underpin the incentive scheme.
Returns	The landowner or manager gets the returns, however they are likely to be relatively small, and may require some expenditure by the landowner or manager to achieve the incentive payment.
Desirable outcomes	This solution is likely to only incentivize land management changes and environmental outcomes may only be a small part of the incentive requirements.
Certainty	Most incentive schemes have some kind of verification and audit processes, so the outcomes are relatively certain.
Complexity	These incentives are relatively easy to navigate and often the processors will provide support to access and understand the incentive.
Control	The landowner or manager retains control of the farming enterprise and once the incentive has been paid they are typically free to use the funds as they see fit.
Risk/security	There is no risk for the landowner or the processor paying the incentive, especially if the payment is made after the requirements have been met and verified.
Novelty	This solution is not novel.
Perverse outcomes	There is unlikely to be any perverse outcomes from this solution.
Desirability	This solution is likely to be very desirable especially if it is linked to requirements landowners or managers are already doing. They may lose desirability if the requirements of the landowner continually change or the cost of behaviour change is greater than the incentive payment.

4.15.3 Summary

Processor incentives are likely to encourage landowners or managers to meet the specified practices where they are low cost as the processor incentives are typically small payments that occur after the action has been undertaken. They are likely to be relatively certain in terms of verified outcomes, but they are likely to only incentivise land management change. While these are a valuable part of the solution for encouraging positive environmental outcomes, they are unlikely to be the solution that overcomes financial barriers to more significant land use or land management changes.

4.16 Debt funding (bank loans) including sustainability linked loans and green loans

4.16.1 Description

Sustainability linked loans (SLL) are a form of financial support that require a borrower to meet a set of terms and conditions related to their sustainability performance. A newer form of financial incentive, SLL are gaining popularity across largescale banks, particularly in the current environment where achieving sustainable performance is becoming regulated through plans and legislation. It is also becoming a part of the operating environment for banks as banks look to meet their own environmental requirements such as Climate -Related Disclosures.

This finance solution typically involves a set of performance targets that the borrower commits to achieving over the agreed loan term. The loan rewards borrowers who meet the sustainability targets with a reduced interest rate, or conversely while a borrower meets specific KPIs they access 'special' (aka, lower) interest rates which they may lose access to if KPIs are no longer met. In some instances

higher rates may apply if KPIs are not achieved. Sustainability linked loans are part of a broader trend toward sustainable finance driven by investors and companies looking to align investment with personal or national sustainability objectives.

Existing SLL loan providers in New Zealand include (but are not limited to):

- BNZ Agribusiness Sustainability Linked Loan
- Westpac Sustainable Agribusiness Loan
- Rabobank Sustainable Funding
- ANZ Sustainable Finance for Institutional Customers
- ASB Rural Sustainability Loan
- Kiwibank Sustainable Business Loan.

A green loan is designed for financing specific sustainable projects which require significant upfront capital, for example building infrastructure, irrigation upgrades or water reticulation and stream fencing. Typically offered by major banks these loans are designed to support projects that promote environmental sustainability, renewable energy products, energy efficiency improvements, sustainable transportation initiatives or other projects that meet the lender's sustainability criteria. These have been recently expanded by some banks to push further into the agriculture space.

Green loans, like SLL are a newer novel financing model that is increasing in popularity in New Zealand. The major difference between the two loans is that the SLL is structured with performance targets agreed between the borrower and the lender, an incentivising focus. The green loan, however, is focused on financing specific projects, where the borrower does not require incentivising but support to implement desirable sustainability initiatives. The loan option offers a way to finance sustainable projects and investments, as well as environmental benefits and financial savings.

Existing green loan providers in New Zealand include (but not limited to), ANZ Business Green Loan, BNZ Green Business Loan, ASB Green Loan, Kiwibank Green Loan and Westpac Green Loan. They are accessible to people who can access bank financing and have a suitable capital project. However, they are inaccessible to those who are unable to access bank financing easily. Lending criteria will vary depending on provider however include sustainability focus, environmental impact, financial viability, creditworthiness, loan structure or independent verification.

While these are relatively straight forward, designing the criteria that show the Green Loan is being used in an environmentally friendly manner can be challenging especially for investment in newer or unproven initiatives. The project the funding is used for is likely to be a bounded project within the existing farm system and funding is unlikely to be provided for total farm land use change. It is unclear if these could support partial land use change such as converting a few hectares to horticulture. It is likely this small-scale land use change would need to be presented as a standard business case for a bank rather than a green loan.

4.16.2 Evaluation

Table 17 assesses the debt funding (bank loans) including SLL and green loans solution against the evaluation criteria.

Table 17: Debt funding (bank loans) including SLL and green loans evaluation

Criteria	Evaluation
Scalability	This can reach most farms and can support significant land use change (conversions and capital projects) where it is financial (i.e., has a positive return when accounting for the debt). Limited amount of funds available for these loans.
Accessibility	There are two key barriers to access, one for Whenua Māori who can struggle to access traditional bank debt and the other for those who want to make changes that are not financial (i.e., result in lower returns).
Returns	The banks generate profit through the interest charged, landowners will get any additional financial benefit generated through the investment.
Desirable outcomes	There may be environmental benefits, especially through the use of Green Loans (specific loans for environmental projects). SLL are more likely to encourage land management changes.
Certainty	Outcomes are likely to be fairly certain as most banks are creating criteria to audit and ensure environmental performance is in line with the SLL or Green Loan requirements. Traditional debt financing currently has no such formal requirements beyond being regulatory compliant.
Complexity	This is a relatively straight forward way to access capital, provided the landowners meet traditional banking criteria.
Control	The landowner retains control of their assets, as long as they meet debt repayments.
Risk/security	This is relatively low risk as before banks lend, they typically do all they can to ensure repayment, the key risk is the landowner being unable to repay debt and losing their security (typically the land) as a result.
Novelty	Debt funding is not a novel solution, the moves towards SLL and targeting Green Loans to agricultural projects are more novel, but still common.
Perverse outcomes	This is low.
Desirability	Many landowners like this option as it is known, and they retain control of their assets.

4.16.3 Summary

Debt funding is relatively easy to access in New Zealand currently (with the exception of some whenua Māori). While banks and financial institutions may be more explicitly considering how they take on customers with their climate change and sustainability reporting frameworks and requirements at the moment there is not a significant barrier to access. Both SLL and Green Loans provide a possible way to access cheaper debt funded capital with proof of positive land management actions (SLL) or for specifically sustainable capital improvements (Green Loans), however, these represent a relatively small part of overall debt lending.

The biggest challenge with this financing solution is that the borrower still has to be able to access and repay debt. However, this is balanced by the opportunity for landowners to retain control of their land (provided they can repay the debt). While debt funding is not a novel solution, the moves towards SLL and targeting Green Loans to agricultural projects are more novel. Ultimately these will provide a part of the solution but will not significantly shift the dial on the financial barriers facing land use and land management change, especially where that change has limited or no financial return. The disadvantage of debt funding is that it weakens landowners balance sheet, and many may be reluctant to increase their indebtedness to fund a land use change that may result in lower profitability.

4.17 Crowd funding

4.17.1 Description

Crowdfunding is a way of funding a project or venture by raising money from a large number of people, usually online. Crowdfunder's may support a project for different reasons, such as personal interest, a social cause, or financial reward. Depending on what type of crowdfunding, the money may be raised as a donation, loan, or equity. The best-known platforms in New Zealand include Pledge Me and Givealittle.

Crowd funding models are based on three actors - the project initiator who proposes the idea or project to be funded, individuals or groups who support the idea, and a moderating organisation (the platform) that brings the parties together to launch the idea. Types of crowd funding fit into three broad categories:

- Reward crowdfunding, where the project initiator pre-sells a product or service to launch a new business concept without incurring debt or sacrificing equity. This type of crowdfunding often involves contributors receiving gifts or perks in return for their contribution.
- Equity crowdfunding, where contributors receive shares in the company, usually in the early stages, in exchange for the money pledged. Equity crowdfunding, unlike donation and rewards-based crowdfunding, involves the offer of securities which include the potential for a return on investment.
- Altruistic crowdfunding, where the project initiator is selling a project/cause and investors provide funding purely altruistic reasons and no tangible reward is provided back to the investor, i.e., a donation.

In the context of land use change, reward funding may be relevant where a unique experience is offered as a reward to contributors. For example, access to a recreational site that is not available to the general public. Projects that offer social benefits to the community but not directly to the landowner are best suited to altruistic crowdfunding. For example, establishment of native bush to create a habitat for a rare native species (fauna and/or flora). Examples of crowd funding include:

- **Happy Cow Milk** is a New Zealand example of equity crowdfunding. Happy Cow Milk company seeks to produce milk under a 'more ethically and sustainably' model and sell directly to the consumer. The company holds intellectual property in small scale milk processing (milk factory in a box) and is seeking funding from the crowd to scale their business. In return, the crowd receives equity in the business and egalitarian reward being involved in a business model that is perceived to be more ethical and sustainable than the wider industry model. Equity funding is used to address three key problems (as expressed by Happy Cow Milk), the increase in costs associated with sustainable practices, regulation costs and bulk-produced milk products.
- **Trees That Count** is an established altruistic crowdfunding platform. This is managed by Project Crimson and is helping to plant native trees across New Zealand through a community marketplace to connect tree funders and planters. Funders can donate cash and trees and these are then matched to planting projects around the country. The funders do not get a return, apart from knowing the trees they donate are supporting community restoration projects.

- **Regenerate NZ** is a subscription-based equity crowd funding example. This mahi is designed to regenerate pine forests back to native forests within 100 years based on everyday New Zealanders investing from \$20 per week. The aim is to purchase pine blocks and support restoration and then over time, provide a return for future investors, while also having environmental outcomes. The intent is that in the first 10 years the return will likely focus on timber revenue, then over 10-50 years this return will be based on timber, innovative timber products and carbon, finally over 50 years the intent is to have regenerating plantations and innovative land use models for investors.

4.17.2 Evaluation

Table 18 assesses the crowd funding solution against the evaluation criteria.

Table 18: Crowd funding evaluation

Criteria	Evaluation
Scalability	The size of the 'crowd' likely to limit scale; the general public has only so much money to donate, especially in periods of high living costs. The desirability of land use type projects will also impact the scale, especially as they will be competing for many other causes. These can support a range of land use change from planting riparian areas to converting pine plantations to native bush, or converting to organic milk.
Accessibility	Initiators need to have a 'project of difference'. Offer something unique or appeals beyond a financial investment. They also need to be technology savvy, especially on social media.
Returns	This depends on the type of crowdfunding, if equity is exchanged landowners may dilute future returns. Some types of crowdfunding will potentially generate returns, while others won't (e.g., altruistic crowdfunding).
Desirable outcomes	Could be seeking a range of outcomes that are not necessarily environmental although for it to appeal to the crowd it needs to show that it is not detrimental to the environment. This is entirely down to the desires of the person running the campaign and those investing in it. It has the potential to create a highly loyal customer base that is prepared to pay a premium because they believe in the 'cause' if there is an associated product.
Certainty	No real audit and regulatory requirements. Platforms (Pledge Me) comply with Financial Market Conduct Act 2013.
Complexity	It is relatively simple to navigate various platforms but requires time for promotion.
Control	The landowner or manager retains control of the farming enterprise.
Risk/security	Low risk to the landowner. Significant risk for the contributor, if they are expecting a
Novelty	Highly novel in relation to land use change, causes around trapping pests and planting trees are more common.
Perverse outcomes	The use of a platform and crowdfunding campaign may lead to high social media scrutiny.
Desirability	High level of desirability where project initiator and contributors (crowd) are well matched.

4.17.3 Summary

While crowd funding is successful in certain cases, it is challenge to scale. It appears crowd funding is most successful when the campaign is small and donations that are pooled for projects (e.g., Trees That Count) or there is a hero project (such as Happy Cow Milk, or the New Zealand campaign to successfully buy Awaroa beach). Without these, connecting funding and projects can be hard. New models in the crowdfunding space are showing opportunity (e.g., RegenerateNZ) but these are yet to be proven.

4.18 Value-added products

4.18.1 Description

This financing solution is when landowners develop new products with an environmental 'selling point' e.g., organic direct to consumer milk, to generate additional income to further fund environmental actions. More and more of these options are taking advantage of changing shopping habits and improved connectivity to create subscription-based services around their value-added products which help ensure some security of income. This has been widely used in New Zealand at a range of scales, examples include:

- **Lewis Road Creamery** has made a name for themselves producing dairy products using organic milks, jersey cow milks and premium ice creams, flavoured milks and butters. They run low environment footprint selling points such as packaging and starting to roll out refilling stations. They have won awards for a range of their products as well as their packaging.

To support their premium products, Lewis Road Creamery are pushing their suppliers to adopt practices that are seen as environmentally desirable, including organics and palm kernel expeller free milk. They are wholly owned by Southern Pastures who are advancing their own sustainable farming via a unique independent third party certified suite of ethical practices called "10 Star Certified Values" (grass fed, GMO free, 365 days free range, exceptional animal welfare, environment sustainability, antibiotic stewardship, human welfare, climate change mitigation, no growth hormones and no palm kernel or animal feeds).

- **Silver Fern Farms Net Carbon Zero Beef** is a range of 100% Angus beef products processed by Silver Fern Farms (SFF) to be certified as net zero carbon emissions. This means that 100% of end-to-end greenhouse gas emissions are measured and then balanced out by verified woody vegetation that is actively absorbing the equivalent amount of CO₂. This is certified by an independent third party. Vegetation only occurs on farms that supply SFF with 100% Angus beef cattle. The carbon claims are also approved by the USDA. These products then sell for a premium with some of that making its way back to the landowners which can help them meet the processor requirements for their products (i.e., net carbon zero).
- **Meat Box** is a family owned, New Zealand wide meat delivery service using grass fed and antibiotic free meat as a selling point. They partner with local farmers and cut out the middleman (i.e., supermarkets) and deliver high quality meat direct to consumers. By supplier high value products direct to consumers they can deliver extra value back to landowners who supply them. In exchange they use the quality of their products and practices of the farms as a selling point and so the landowners can then use this premium to ensure they meet these processor standards.

The challenge with this value-add solution is that typically landowners have to invest in their point of difference credentials, before they can then obtain a premium for them in the marketplace. So, while a premium may be useful to offset further investment it doesn't necessarily support the initial investment in securing a point of difference or setting up the channels needed to access the premium price. In addition, it is likely that there is only so much value-add that can be absorbed by consumers as premium prices given limited consumers who can afford these. It is possible that the environmental points of difference eventually become expected as part of a commodity as well and the premium is lost or needs to be adjusted to focus on the next point of difference.

4.18.2 Evaluation

Table 19 assesses the value-added products solution against the evaluation criteria.

Table 19: Value-added products evaluation

Criteria	Evaluation
Scalability	There is no reason this solution cannot reach many farmers provided they meet the criteria or can create a value-added product. However, it is only likely to incentivize small changes in land use or management change.
Accessibility	While there are no barriers to more farmers creating, or accessing, premium products, at some point in adoption, these products will become the norm, and effectively lose their premium.
Returns	The returns from this will get shared out along the value chain, if it is a direct to market product, they will get more premium, if it is a long value chain this return will get shared out. Regardless, these returns are likely to be small.
Desirable outcomes	This will likely create positive change, and this will likely be environmental given the way consumer preferences have changed. However, these are likely to be incremental (if applied to many farmers/growers), though they could be larger if targeting smaller groups of farmers.
Certainty	These are likely to be relatively certain given the risks of greenwashing for consumer confidence and returns.
Complexity	These are relatively straightforward once developed.
Control	The landowners would retain control as they chose if they create or supply value-added products.
Risk/security	These are low risk as the landowner can change supply arrangements if desirable.
Novelty	These are not novel solutions.
Perverse outcomes	It is unlikely these have perverse outcomes. It is possible that the landowners do not access much of the premium if the supply chain is long.
Desirability	This will be desirable for some landowners, however, others will prefer to supply standard products.

4.18.3 Summary

Value-added products are not a novel solution, they have been growing in popularity in recent years and are often built around broad sustainable credentials. However, they are likely to only incentivise incremental changes on land management and land use and will only reach some farmers as once the majority adopt the environmental practices, they are likely to become expected by the consumer and lose their premium or need to continue to push practices further.

4.19 Other potential financing solutions

A few other financial solutions were discussed in this project but were not explored further due to key barriers, including scale.

4.19.1 Green bonds

Green bonds have been rising in popularity and use internationally and in New Zealand. The key difference between a traditional bond and a green bond is that a green bond is issued for the purpose of funding a project or investment which drives a defined environmental benefit. Internationally, green bonds are predominantly used for funding 'green infrastructure'. There can be a range of types of green bonds from loans to asset backed securities. Green bonds are typically issued to wholesale investors but more are becoming available in mutual/exchange traded funds. Green bonds work just like any other corporate or government bond. Borrowers issue these securities to secure financing for projects that will have a positive environmental impact, such as ecosystem restoration or reducing

pollution. Investors who purchase these bonds can expect to make a profit as the bond matures. In addition, there are often tax benefits for investing in green bonds. Despite efforts like those of the Climate Bonds Initiative, there is no universally recognised standard for determining the environmental friendliness of a bond. In some cases, debt instruments may be marketed to investors as “green” but actually are greenwashing.

Launched in September 2022, New Zealand’s Sovereign Green Bond Programme provides the opportunity to invest in projects that contribute to climate and environmental objectives. The primary challenge for landowners in accessing this funding is the scale. Landowners would need to consider how they generated projects that were of significant scale for this financing mechanism. For example, the issue of a green bond for the purpose of establishing or regenerating native forests would fund the seedlings, labour and maintenance of the forest and the issuer would need to evidence the positive environmental impact of the forest to bond holders. Throughout the life of the bond, issuers would be expected to validate the credibility of those impacts by getting independent assurance or verification of performance, an evaluation or credit rating from a ratings agency, or formal certification from external parties such as the Climate Bonds Initiative.

4.19.2 Government capital investment

One option that was discussed as an early conceptual idea was the Government, likely through an organisation such as Pāmu™, purchasing farms, completing capital development and then reselling this land. The idea is that the capital development would be environmentally beneficial activities and these actions would then be protected through a suitable mechanism (e.g., through the QEII Trust for native plantings) and then when the land was sold the government would access some return on their investment through a higher sales price. The key consideration with this mechanism is that the Government is taking on board the risk in relation to both the operating of the land in the short term (which could be mitigated through using Pāmu™), as well as the return on investment when selling the land. There are no guarantee land prices will hold (or increase) through the development phase and equally the market may not pay extra for the environmental development. While some mechanisms exist, such as the QEII Trust to protect some environmental actions, others would be harder to lock in for perpetuity.

4.19.3 Environmental non-fungible tokens

Non-fungible tokens (NFTs) are unique digital identifiers that are recorded on a blockchain and are used to certify ownership and authenticity. They cannot be copied, substituted, or subdivided. The ownership of an NFT is recorded in the blockchain and can be transferred by the owner, allowing NFTs to be sold and traded. These are being used to support the sale of carbon credits (e.g., CarbonABLE) but are also starting to be used as play-for-purpose games. Zeedz is a play-for-purpose game designed to raise awareness, generate financial contributions and build a community around the issue of global warming and climate change. In Zeedz, players reduce carbon emissions by collecting blockchain-based plant-inspired creatures that grow with the real-world weather. The financial contributions created by players directly go to specifically defined, evaluated and audited non-profit projects that focus on reducing global emissions, turning players’ progress into direct emission reductions. There is potential for new technologies such as NFTs to support land use and land management change through direct investment, or as an enabling technology such as in platforms like CarbonABLE.

4.19.4 Third-party credit guarantees

The provision of credit guarantees to enable borrowing from Tier 1 lenders is an existing mechanism that underpins “riskier” finance in both residential (i.e., low deposit first home buyers) and commercial

(i.e., small business) lending situations. In rural lending, it is not uncommon for related entities or persons (i.e., parents) to guarantee loans where serviceability is adequate, but security is not. In all these cases, the guarantees tend to be provided by entities or persons closely related or affiliated to the borrower and rely on cross-securitisation or personal guarantee of repayment to secure the lending.

The use of third-party credit guarantees is rare in New Zealand, except perhaps in the case of crisis or event recovery, where the Government might use its balance sheet (i.e., the New Zealand taxpayer) to guarantee finance used for this purpose (i.e., the recent credit guarantee for horticultural recovery from Cyclone Gabrielle). With the security of repayment for a large proportion of any debt, commercial banks appear prepared to either provide finance (where none would otherwise have been offered) or to do so on improved terms (i.e., lower interest rates). It seems unlikely the Government would leverage its balance sheet to allow individuals to change land use to reduce environmental externalities (as this is increasingly seen as a business-as-usual activity). However, third parties seem to be offering this as a service in some jurisdictions. For example, the AGR13 fund (AGR13, 2023)

“will provide guarantees to commercial banks and other financial institutions, and subordinated loans to customers of these institutions, which will become known as ‘partner-banks’, to mobilise financing by de-risking and catalysing transactions that actively prevent deforestation; stimulate reforestation; contribute to efficient sustainable agricultural production; and improve rural livelihoods”

Whether such a mechanism is essentially a form of impact investment, or its own discrete solution is a moot point. While this credit guarantee is likely to come at a cost to either the borrower (for increased access to finance) or the lender (potentially allowing it to increase interest income without holding additional capital), this mechanism could allow the deployment of more capital to activities that have lower financial return but a higher social return.

5 Ranking of each solution and recommended actions

5.1 Ranking potential solutions for further analysis

The aim of this project is to investigate potential novel financing solutions that support environmentally beneficial land use and land management change. It focuses on changes that are environmentally beneficial but face a financial barrier and need new financing options. This report is designed to provide a list of possible solutions alongside an evaluation framework and recommend where further support and/or analysis is needed in developing financing solutions. In order to prioritise the financing solutions regarding this project aim, the following groupings were established:

1. **Prioritise for further action** – is a potential solution with a lot of promise but needs more support; this could be research or development to really make it a viable option for landowners.
2. **Potential solution but faces a big challenge(s)** – is a potential solution but has a big challenge(s) preventing it from being as promising as other options.
3. **Some potential but likely limited benefits** – is a useful solution but is unlikely to be able to be developed much further than its current use.
4. **No further action needed** – the solution is either already well functioning or is not considered a viable option to support land-use change.

To generate these rankings a range of methods were used, this includes a survey of participants (discussed in Section 1.4), drop-in sessions with participants, the discussions and notes from the original workshops as well as insights from the project team's research. The aim of these rankings is not to say one option is 'better' or 'worse' than another, as this is determined by the lens through which this question is answered (e.g., what may be better for a farmer may focus on retaining control but this may differ by farmers and may be different for investors). Instead, the rankings are designed to help identify what solutions have significant potential but need further support, development or research. For example, a solution may be listed as no further action needed, this does not mean that it is not an integral financing option, but that it is currently functioning well and does not need further development. Table 20 discusses the ranking of each solution.

Table 20: Reasons for ranking for each financing solution

Ranking	Financing option	Key reasons for ranking of each option
1	New products	People are starting to take advantage of this (especially biodiversity credits) on a small scale, and there is significant further opportunity in this solution. However, there are also some significant conversations and questions that still need to (or are) occurring to maximise the benefit of this solution in supporting land use and land management change.
	Philanthropy and impact investment	There is money available in this financing solution and the survey participants ranked this highly. However, it tends to suit large scale or projects with a unique selling point. The biggest barrier to this mechanism that needs considering is how to better match projects to investors and find the right investors/philanthropists. To generate projects of suitable scale, collective projects or groups may be needed.
2	Māori to Māori investment collaborations	Māori entities (hapū, iwi, hāpori and pakihi), sometimes with government and/or third party (non-Māori private sector) support, are realising the benefits of investing capital with similar entities whose collective values and interests align (e.g., intergenerational) and whom have a primary focus on balancing kaitiakitanga with commercial goals. The biggest barriers to this solution are relevant governance expertise, time to align, and transaction costs.
	Long term lease development partnership	These can work well for well governed entities who have land assets but very limited capital, or access to capital for development. The biggest challenges that need to be overcome are ensuring appropriate governance expertise, visibility on this option, support in identifying appropriate partners, and examples of successful partnerships.
	Dividend reinvestment (whenua Māori)	This financing solution has been identified as having significant potential. However, it faces considerable policy and legislative decision challenges to make it an accessible solution for whenua Māori entities. It is not guaranteed that this option will lead to environmentally beneficial land use and land management change, but it could. Significant weather events, planning for climate change and consideration of what it takes to be responsible kaitiaki of taonga tuku iho (including tangata) etc. will be part of the decision-making challenges.
3	Blended finance models	There is a need for these models to fund novel and risky research and large-scale projects, overall, they are currently working ok based on survey and workshop feedback. They have high transaction costs and would benefit from a mechanism to help reduce these. These solutions are critically important in funding research that will support next generation environmental solutions.
	Government and regional council funding	This is in place at various levels, regional council funds and central government has a range of funds, mostly accessed through grants. There can be high transaction costs, however, this is necessary with public funds. This funding mechanism is critical for risky projects and when provided as grants ultimately exhausts capital. This mechanism could be improved by considering how regional councils could provide loan facilities to support land use change, which would also recycle capital.
	Endowment fund	Self-sustaining endowment funds have opportunity and potential benefits, however there is more work to be done on how best to address challenges related to the best scale, administration, legal and governance structures and where the seed funding comes from. Consideration needs to also be given to how the fund is sustained and currently they can likely only provide grants due to lending rules.
	Pooled collectives	The economies of scale, pooled resources (capital and knowledge) mean this option can support land use and land management change. However, it is likely to be most effective in specific solutions where groups of landowners have a shared vision/leader to coalesce around. This solution may face challenges in being extended to all landowners as it can be challenging to find the right people at the right time.

Table 21 cont.: Reasons for ranking for each financing solution

Ranking	Financing option	Key reasons for ranking of each option
3	Joint ventures and equity partnerships	These bespoke arrangements are contributing to land use and land management change, however, there is no guarantee that these are environmentally beneficial focused changes. A big concern is losing control of an asset and as such the parties' values and how contracts are structured are important to ensure the arrangement works for all parties. The biggest barrier to these arrangements appears to be finding the right partners, this could potentially be further supported.
	Peer to peer lending	Peer to peer lending for personal lending has not been extremely well utilised in New Zealand and there is no current platform that is targeted at rural small businesses as the borrowers. To enable this as a financing option there is significant research needed in terms of desirability (market research) as well as development of an enabling platform (this would build off existing work done by AgResearch). While this is an option that needs significant work, it may have potential in supporting land use and land management change, however the likely driver will be financial rather than environmental returns.
4	Private managed investment fund	These have no certainty of positive environmental outcomes. Currently they are primarily seen as financial instruments and any beneficial environmental outcomes are at the discretion of the fund and investors. While they may have economies of scale and capital to invest in environmentally beneficial land use and land management change, there is no requirement to do more than the regulatory minimum. Due to being publicly listed, disclosure requirements provide some certainty of environmental outcome where the company decides to do them.
	Farm based listed companies	This financing solution has no certainty of positive environmental outcomes. Currently they are primarily seen as financial instruments and any beneficial environmental outcomes are at the discretion of the fund and investors. While they may have economies of scale and capital to invest in environmentally beneficial land use and land management change, there is no requirement to do more than regulatory minimum.
	Processor incentives	These are important mechanisms for supporting land management change. They may continue to support land use change if the targets continue to push towards better practices. However, these are seen as well functioning and not needing further development.
	Debt financing (bank loans) including SLL and green loans	Debt financing is an important part of the land use and land management change solution. They still require the landowner to be 'bankable' and meet the criteria. They provide relatively certain and auditable environmental outcomes. The SLL are still a relatively small proportion of overall rural debt so there is scope for these to grow further, however this is likely to occur overtime as a result of banks moving to ensure their own environmental performance.
	Crowd funding	While this is working in some cases very successfully and is a useful mechanism, it is unlikely to generate the scale of land use and land management change needed. The initiatives that are working should continue to be supported, especially where individual contributions are combined for bigger impact.
	Value-added products	These solutions operate at a range of levels (e.g., large-scale processors combining products from producers through to individual producers creating their own unique product) and can be successful at creating land use change. However, they tend to focus on more incremental land use and land management change. They are also challenging in a world where consumer preferences change, value-added attributes become expected, too expensive or fall out of fashion. This solution is beneficial for land use and land management change but is currently driven by producers and processors who see an opportunity and can successfully act on that.

Figure 2 presents the average ranking score from the survey of workshop participants for the financing options. The option in green (new products) was the only option that was considered to have an average ranking of “1” (prioritise for further action) when rounded. In addition, pooled collectives was added after the survey and therefore was not ranked.

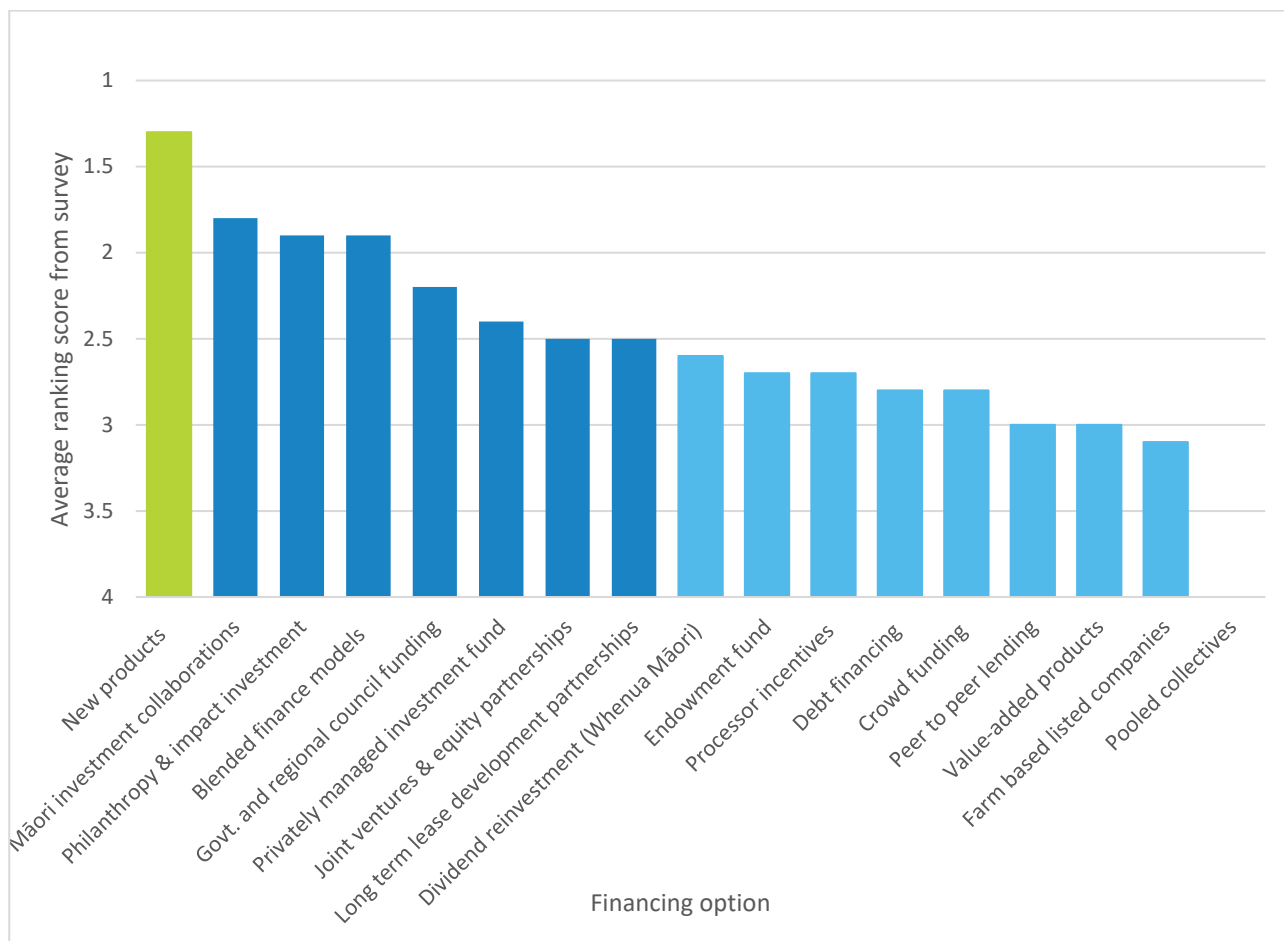


Figure 2: Average ranking from the survey

Some options were ranked differently in the survey to the final ranking assigned in this final report, which also included workshop feedback, post survey discussions with survey respondents and research. No options had an average score of 4, however this was potentially because in surveys, respondents can avoid options associated with no further action, especially when there is no associated ‘cost’ for them.

Some of the options that this report provided a final ranking in the ‘3’ category but were ranked higher in the survey were blended finance (scored an average of 1.9 in the survey), government and regional council funding (scored an average of 2.2 in the survey) and joint ventures and equity partnerships (scored an average of 2.5 in the survey). Based on feedback these survey results reflect the importance of these financing options to supporting land use and land management change, however they ranked slightly lower in the final ranking not because they do not have potential to support change but because they are generally functioning currently and there is no urgent action needed to improve these options.

The other differences in the final ranking versus the survey were dividend reinvestment (whenua Māori) which ranked 2.6 in the survey but a 2 in the final report, privately managed investment fund which ranked a 4 in the final report and a 2.4 in the survey and philanthropy and impact investment

which ranked 1.9 in the survey and 1 in the report. Private managed investment funds were ranked lower in this report as there is limited evidence to suggest that they will be incentivised to make more environmentally beneficial changes than previous landowners, despite being likely to have more access to capital. Dividend reinvestment (whenua Māori) was ranked higher in the report than the survey as through the course of this project the authors heard examples of how this could make a tangible difference to whenua Māori entities and has huge potential to overcome the challenge of these entities accessing traditional banking debt.

5.2 Recommended actions

Table 21 presents recommendations for further work for those solutions ranked as a '3' ("some potential but likely limited benefits) or higher. Priority should be given for actions that may cross over multiple financing options or for those that are ranked higher (i.e., prioritise actions for financing options ranked as a 1 over those ranked as a 3).

Table 21: Recommended actions for each financing solution ranked at higher than a '3'

Ranking	Financing option	Recommended actions
1	New products	<ul style="list-style-type: none"> • Conversations on a biodiversity credit market need to be linked across various stakeholders to ensure cross pollination of solutions and ideas. While there are sometimes sensitivities around data sharing and timing of collaboration, this is a solution that is too important to get wrong. • Consider how various environmental benefits could be linked, carbon, biodiversity, blue carbon etc. into these conversations. • Consider design implications such as who can buy and sell credits (especially in relation to replacing foreign income from exporting), who owns credits long term and the potential implication for New Zealand outcomes and how this type of market may support (or negatively impact) different types of land and landowners. • In order to design further research on this financing solution, a detailed gap analysis needs to be completed in conjunction with all the various parties undertaking work in the biodiversity credit (and similar) markets.
	Philanthropy and impact investment	<ul style="list-style-type: none"> • Consider working with key stakeholders to identify and socialise how to better match funding to projects. This would include groups such as NZTE, MPI, NEXT Foundation etc. • Assess how collective groups or projects could be re-scoped to create projects that better appeal to philanthropic investors.
2	Māori to Māori investment collaborations	<ul style="list-style-type: none"> • Highlight a regional or national commercially viable kaupapa, opportunity or project idea that is positive for the people and the environment. • Feasibility and business cases to assess the project's due diligence, with support from an experienced investor e.g., Poutama Trust. • Find partners whose strategy, vision and te ao Māori values align.
	Long term lease development partnership	<ul style="list-style-type: none"> • Work with an appropriate stakeholder(s) to demonstrate how these partnerships could be structured successfully and provide example of best practice legal documents and frameworks. • Assess if a third party or platform can provide a useful platform to connect potential parties.
	Dividend reinvestment (whenua Māori)	<ul style="list-style-type: none"> • Support conversations in this space, including with the likes of whenua Māori, the Māori Land Court, Te Tumu Pareoa and Te Puni Kōkiri. • Needs to have policy change with multiple owner support and/or legislative change to be readily accessible.
3	Blended finance models	<ul style="list-style-type: none"> • Assess if transaction costs can be reduced either through funding application processes (while maintaining scrutiny of use of public funds) or making the search for partners easier (this could link to mechanisms to match philanthropy and projects as well).
	Government and regional council funding	<ul style="list-style-type: none"> • Work with regional councils and appropriate regulators to consider if regional councils could provide loans again to support land use change. However, this will require significant regulatory changes. • Assess if transaction costs can be reduced either through funding application processes (while maintaining scrutiny of use of public funds).
	Joint ventures and equity partnerships	<ul style="list-style-type: none"> • Assess whether a platform to support potential partners identifying each other would be a desirable way to support further uptake of this potential financing solution.
	Endowment fund	<ul style="list-style-type: none"> • Work with NZ Landcare Trust and catchment groups to identify if this is a desirable financing solution and if so, with what design features.
	Pooled collectives	<ul style="list-style-type: none"> • Work with groups like Te Puni Kōkiri and NZ Landcare Trust to understand what support could be provided to collectives to help them utilise or access funding to support land use change.
	Peer to peer lending	<ul style="list-style-type: none"> • Consider market research using a draft concept of a potential platform (potentially simplified from AgResearch's existing work) to assess if there is a desire to develop this further.

5.3 Enabling factors or barriers

Throughout this project there were some key underpinning factors that were identified across the financing options. A factor could be a barrier for some financing solutions and an enabler for others. These factors are briefly highlighted here:

- It is critical to have strategic national investment (through the government and science systems) to ensure there is investment in high-risk projects which underpin the future land use change and land management changes for environmentally beneficial outcomes. The role of government funding in de-risking novel projects alongside private investment must continue. Due to the scrutiny and accountability of using public funding, accessing this funding has high transaction costs. It is a fine line between lowering these transaction costs and retaining scrutiny of public funds. An example of a way to help reduce transaction costs of utilising public funding would be a more staged application process to avoid sunk investment in complicated applications that are not successful. There are recent examples of PGF, now Kānoa, providing grants and/or loans. A Māori bank supported by government could be an enabler.
- Many of the identified solutions can provide environmental benefits but are at the discretion of those in charge of the financing option. For example, while private managed investment funds or bringing in equity or joint venture partners solve the problem of access to capital, the use of this on environmentally beneficial land use and land management change is purely up to those involved. This is especially the case in private business ventures where the only mechanism to provide certainty of environmental outcomes is regulation facing all landowners. Existing regulation on land use change provides a backstop to ensure actions at least adhere to the minimum environmental requirements when capital becomes available is critical.
- One key challenge that has led to landowners pursuing traditional financing routes is the desire to retain control of their assets i.e., the decisions they can make about them. This is an understandable desire from landowners and has led to a preference for debt funding where landowners retain control of their asset. Exploring ways to manage this risk in more novel financing solutions would help in making these more favourable for landowners. For example, exploring how the contractual arrangements could be structured within applicable financing solutions or how parties could use voting and non-voting shares to help manage this risk.
- One key challenge is identifying the right parties to the financing solution, this could be the joint venture partner, the partners in the blended finance model or the right people to lead pooled collectives or Māori to Māori investment collaborations. The solutions that rely on finding the right partners often only occur when/if these right partners come together at the right time, and working with other individuals is also one of the biggest risk for landowners. A mechanism which can help people identify partners with aligned values and needs would have benefit across many of the financing options. While those who have investment opportunities may not want to list in a public forum for competitive reasons, those potential investors may want to list in some kind of forum that those with potential investments can search. While there are a range of potential ways to structure this, a possible starting point is a virtual public 'notice board' where those looking for some kind of investment or financing partner could essentially list an advertisement. This would need to be maintained by some kind of public agency (e.g., Ministry for Business Innovation and Employment), however it is likely they would need to have some kind of disclaimers as they are not guaranteeing those on the notice board are sound investment options.

- The changes to lending requirements (Responsible Lending Code and Anti-Money Laundering and Countering Financing of Terrorism Act 2009), while well intentioned, seems to present a big barrier for those more novel lending arrangements. For example, endowment funds, pooled collectives and regional councils can provide grants but providing lending that needs to be paid back is much harder, or not possible, under this Act. As such, this is currently a legislative barrier to these novel financing solutions.
- Throughout this research it became clear that many stakeholders are discussing various considerations related to sustainable finance, financing land use change and various financing solutions discussed in this report. However, these conversations are often being had in different sectors or stakeholder groupings and not all of them are connected. Where there is a lack of connection, then the conversations may generate solutions that suit for example the landowners or the financing sector or the policy sector but not the other sectors. It is important to overcome these disconnects and create cross sector, cross discipline and cross stakeholder conversations.
- Some of these financing options will require individuals and entities to have reasonable financial and/or governance expertise. For example, if pooled collectives decide to set up an endowment fund, then this will need a reasonable level of expertise to ensure this is managed appropriately. While some of this expertise can be contracted in such as through consultants, financial advisors, lawyers and professional directors the parties involved in the land use entity will also need to understand the support they need and be able to appropriately manage the investment day to day. There may be additional education and/or support required to help landowners and groups take advantage of these more novel financing options.

5.4 Case study analysis

To support the evaluation of potential solutions three case studies were developed. The case studies are summarised in Table 22 and explained in detail in Appendix 2.

Each of the five solutions that were ranked as a '2' (potential solution but faces a big challenge(s) or '1' (prioritise for further action) were evaluated at a high level against the most applicable case study to sense check the suitability of the approach and develop an understanding of how this might look and work in practice. These are presented below.

Table 22: Case study summary

<p>Case study 1 – Sheep and beef farm</p> <ul style="list-style-type: none">• Jeff and Cynthia Hamilton are sheep and beef farmers in the Omatane district, located 25 km south of Taihape township. The couple purchased the farm seven years ago after building up capital, both Jeff and Cynthia's parents provided financial support to purchase of the property.• The farm has a total area of 400 ha, comprised of 350 ha of pasture, 20 ha native bush and scrub, and 30 ha in pine plantations.• The pine plantations are established on steeper sideling areas including a sideling that banks the Makopua Stream which is a contributory to the Rangitikei River. The pine plantations range from 23-25 years, and it is the intention of the Hamilton's to harvest these trees in the next 2-3 years.• These plantations are registered in the Emissions Trading Scheme, but due to their age at registration, the Hamilton's have not claimed any NZUs.• The Hamilton's are members of the Makopua sub catchment group which is part of the Rangitikei River Catchment Collective. Water quality monitoring of the Makopua stream has found that sediment and phosphorus are concerns for this sub catchment.• As the pine plantations mature, some trees on the sideling areas have fallen over exposing soil to erosion and in some cases, these fallen trees have slid into the Makopua stream causing blockages and accelerating erosion to the stream's banks.• Horizons Regional Council staff have recommended that, following the harvest of the pine plantations, 5 ha of the land bounding the Makopua stream be replanted in native shrubs and ground cover plants. The cost of replanting these 5 ha in natives is estimated to be \$6-7,000/ha compared with replanting in pine which is estimated to be \$2,500-3,000/ha.• By replanting in native trees, the Hamiltons' will forgo the next \$25,000/ha of net stumpage at the end of the otherwise planned 28-year rotation. Furthermore, as the replanting is on land already considered "forest land" under the ETS, the ability for the new indigenous plantings to accumulate NZUs is significantly constrained.
<p>Case study 2 – East Coast Whenua Māori</p> <ul style="list-style-type: none">• Two neighbouring whenua Māori blocks located in the East Coast of the North Island.• One, is 2,474 ha and has 1,997 registered owners, it is a beef and sheep operation with some forestry on the more marginal, erosion prone parts. The other is 2,696 ha and is managed by a Māori Incorporation which has seven members on their committee of management, this is mainly a dairy operation with some forestry on the more marginal, erosion prone parts.• The owners of both blocks cannot sell the land.• The border between the blocks is the Waikaramea Stream. The health of that stream has deteriorated over the last 60 years.• The overall farming footprint of both large blocks has decreased over the past 60 years. Distance from markets and low infrastructure investment have been issues on both blocks. <p>There is a need to invest in new infrastructure, including fencing, barn, and large equipment, which will require more than \$1 million for each farm. Possible land use change options that the trustees have considered include horticulture, more native and/or plantation forestry, and other livestock.</p>
<p>Case study 3 – Dairy farm</p> <ul style="list-style-type: none">• Michael and Jane Smith are dairy farmers farming in the Te Rehunga district located 15 km west of Dannevirke. It is a third-generation farm. Michael and Jane have one son and two daughters. The eldest daughter aspires to return to the family farm with her partner and take over the operation of the farm as managers for 2-3 years, then 50/50 sharemilk and ultimately purchase the farm from her parents. Michael and Jane wish to keep the farm in the family too but also want to be fair to the other two siblings.• The farm has a total area of 85 ha, and 80 ha is milked off.• The farm's nitrogen loss to water is estimated to be 45 kg N/ha. The maximum nitrogen loss limit is 27 kg N/ha in year one and reducing to 21 kg N/ha by year 20. The primary causes of the farm's high nitrogen loss are high rainfall and free draining soils.• One option to reduce nitrogen loss is to build off-pasture infrastructure. This will require significant capital investment, possibly as much as \$500,000. The Smiths don't want to take on additional debt at their stage of life and don't want to encumber the business with more debt that may constrain their succession plan with their daughter.

5.4.1 Case study analysis - New products (sheep and beef case study)

The proposed change for the Hamilton's is to replant five hectares of pine plantation with natives. Based on increased planting costs, the practical ineligibility of the new plantings for carbon in short to medium term and the loss of timber income, the cost of doing this is currently prohibitive for the Hamilton's, both in terms of capital upfront and forgone income. If a biodiversity credit scheme was available that helped even out the income disparity between the carbon from the pine plantation and native plantation (say \$600/ha of new biodiversity/year) this would help overcome the ongoing financial barrier from transitioning to natives. The capital cost of planting natives is also a barrier for the Hamilton's. One option to overcome this is if the biodiversity credit scheme was front loaded so that the return was averaged rather than building up as the native bush is growing.

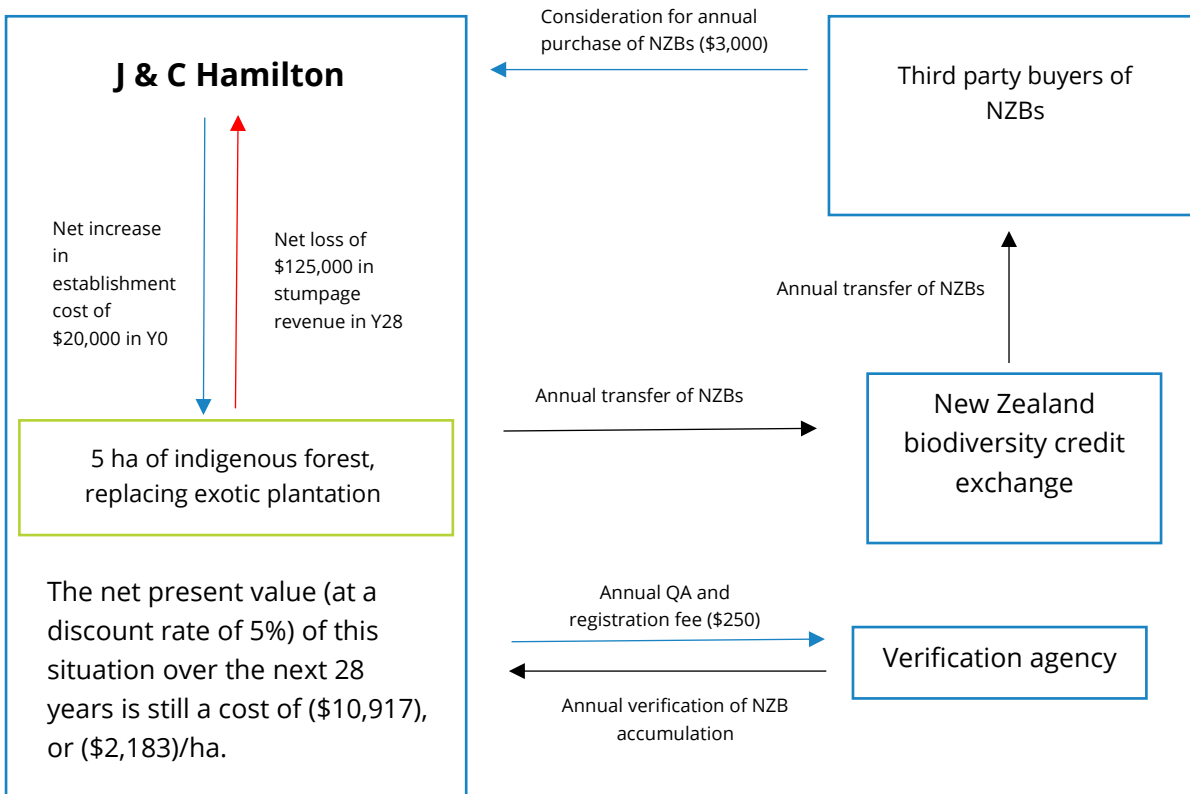


Figure 3: Case study analysis - New products (sheep and beef case study)

An alternative option that might support this is if the Hamilton's could access a loan from either the regional council or their local catchment group. While this is not currently an option within the responsible lending requirements, being able to access the upfront capital cost as a loan from the Regional Council (and repaid through targeted rates) would help the Hamilton's spread this capital cost over a longer term (when they are generating biodiversity credits from the planting). As a loan, the money would be repaid and then be available to support others. While the Regional Council may not currently provide loans for native plantings, this may change if native plantings start to earn specific funding in biodiversity credits as it may be seen as providing capital funding for a commercial venture.

5.4.2 Case study analysis - Philanthropy and impact investment (sheep and beef case study)

The Hamilton's, working with the Regional Council, have identified that it is not only their property that has trees falling into the stream creating dangerous conditions, potentially blocking the stream and sediment entering the water from the streambanks. As a result, they have worked with other landowners in stream catchment and formed a catchment collective. Through this collective and the Regional Council, they have created a "Friends of the Makopua" project aimed to retire and restore all critical riparian margins along the stream, creating a native biodiversity corridor, helping to restore the stream and de-risking the impact of sediment and debris flows in the stream during flood events.

By joining forces with other landowners and creating a 'hero' project the collective has managed to attract philanthropic funds. They have worked with Samantha DeGroot, a wealthy IT investor who grew up in the district and now wants to support river restoration, to provide capital of \$2,000/ha to help landowners adjacent to the Makopua stream as grants for fencing and planting. Samantha has made a one-off donation of \$500,000 to the Friends of Makopua project. This capital investment makes it more viable for landowners to undertake the required work. In exchange, the landowners then commit to working to maintain this investment on their properties.

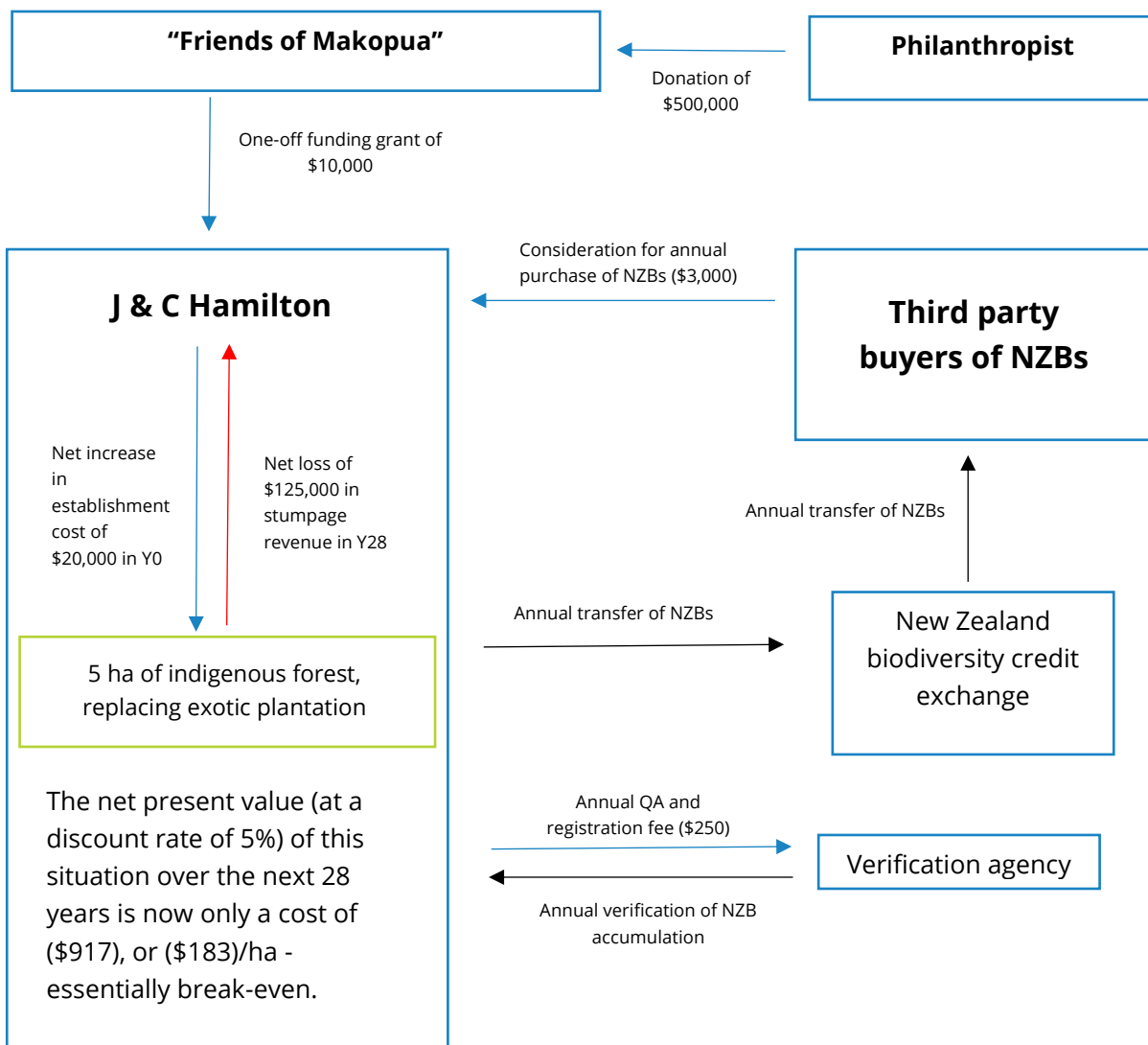


Figure 4: Case study analysis - Philanthropy and impact investment (sheep and beef case study)

5.4.3 Case study analysis - Māori to Māori investment collaboration (whenua Māori case study)

The East Coast Whenua Māori Blocks and their local hapū have investigated land use options including kiwifruit, avocados and macadamia nuts. Feasibility studies and a business case (funded through Te Puni Kokiri) were completed to establish 5 ha of kiwifruit on each block, a total of 10 ha. During the feasibility and business case phase, the iwi was part-way through their Tiriti o Waitangi settlement process and negotiations. Both Whenua blocks and their hapū entity put together a joint venture proposal which also included a government funded loan (through Kānoa) of \$5 million which needed to be paid back by year 15. Seven other whenua Māori blocks as well as some hapū signed up to the joint venture. The seven whenua Māori blocks invested a total of \$1.5 million. Four hapū invested a total of \$3 million. There was also some minor private/individual investment.

By going through the process of feasibility studies and a business case, the interested Māori entities were able to make informed commercial decisions, as well as check each other's commitment to whenua, whakapapa and values such as kaitiakitanga, manaakitanga, and whanaungatanga.

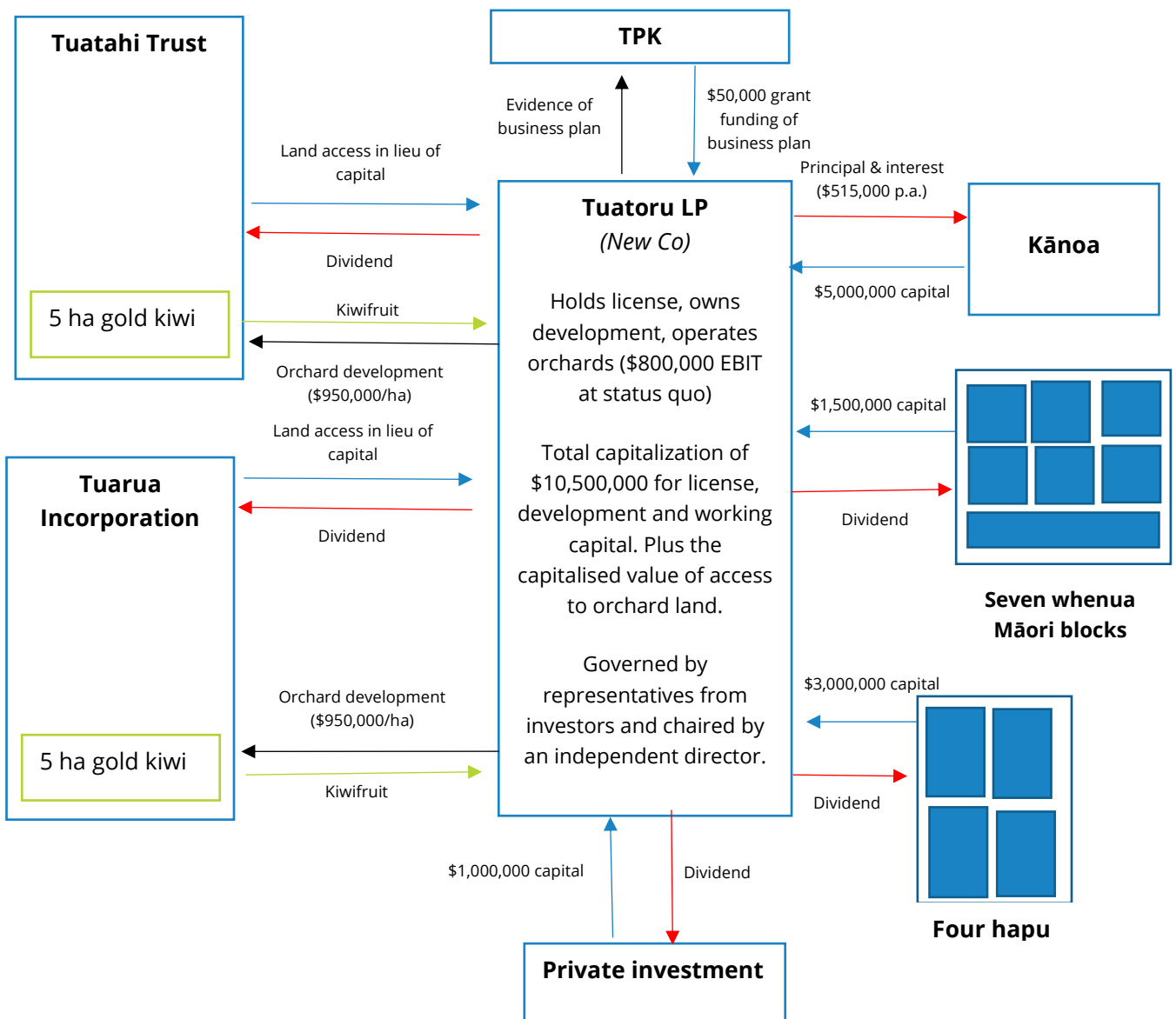


Figure 5: Case study analysis - Māori to Māori investment collaboration (whenua Māori case study)

5.4.4 Case study analysis - Long term lease development partnership (dairy case study)

The Smiths have done analysis and assessed that the only way they can remain a dairy farm and meet water quality requirements is to build an off-pasture structure such as a barn to hold cows off pasture during the autumn (though they will also use it during the rest of the year). However, the parents do not want to take on any debt and the daughter and her partner cannot afford to buy-in as sharemilkers and fund an off-pasture structure. As such they have been looking for a partner who can help with this transition and development.

The Smiths have decided to create a lease development partnership within the family. Between the three siblings, they have formed a company as partners who will buy the cows, machinery and supplier shares from the Smiths, jointly fund the development of the barn (with some bank debt) and, in exchange, lease the land at a partially discounted rate from the parents, with an agreed sum to be paid for the shelter at the end of the term. This will be run by the eldest daughter, who will be paid a management wage by the leasing company. Once the term has been completed and the land transfers back to the parents with the shelter, the eldest daughter will come on board as a sharemilker and buy her parents out over time at market rates.

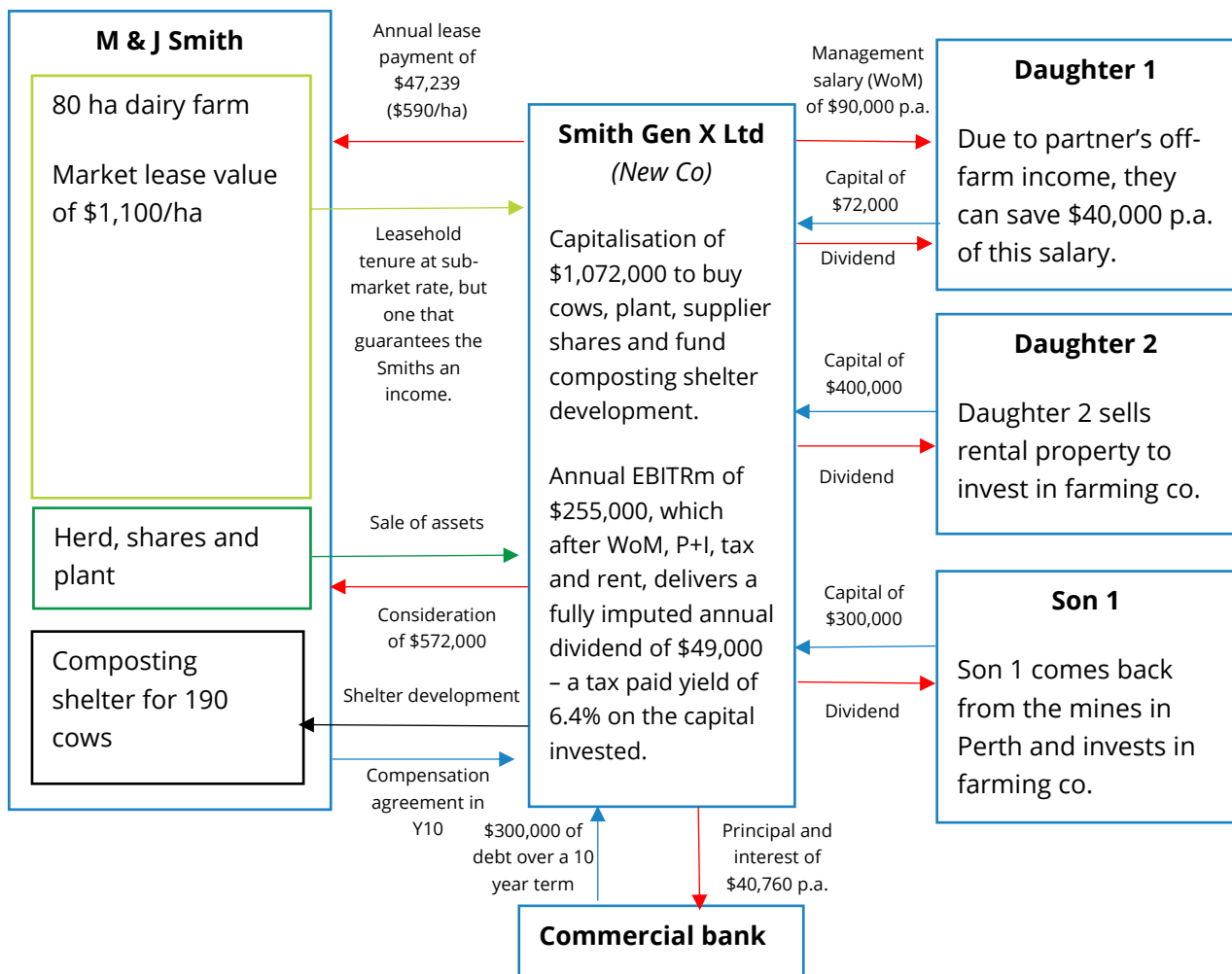


Figure 6: Case study analysis - Long term lease development partnership (dairy case study)

After 10 years, the bank debt is repaid, Daughter 1 will have saved over \$400,000 and can buy the operating assets (with some bank debt) off Smith Gen X Ltd in order to sharemilk for her parents. The Smiths will then buy the composting shelter off Smith Gen X Ltd for \$300,000 - an agreed sum that ensures the three children are expected to have achieved an overall after-tax (internal rate of) return of

7.3% (including dividend and the herd/plant/share sale) over the 10-year period. This balloon payment for the shelter could also be converted to equity in the farm lieu of the cash payment.

5.4.5 Case study analysis - Dividend reinvestment (whenua Māori case study)

The East Coast Whenua Māori blocks have more than 3,000 shareholders, many of whom are 'missing shareholders'. The respective committees of management do not hold current addresses or bank accounts for the missing shareholders. This means that both blocks have unclaimed dividend funds (pre-1980s) that they must hold. There are totals of \$12,000 and \$10,000 in interest income, respectively, from investing unclaimed dividends in high interest rate accounts. This accumulated interest can be used for land use change.

There have also been no dividends distributed over the past ten years due to slumps in stock prices and deficits. Whenua Tuatahi Block has \$80,000 in unclaimed dividends recognised as a non-current liability. Whenua Tuarua Block also has \$60,000 in unclaimed dividends. Utilisation of these funds for other purposes is prohibited. However, whenua Māori are interested in the outcome of Te Tumu Paeroa's consultation process of using the Common Fund.

Both Whenua blocks trustees and Committee of Management could use the interest they have, together totalling \$22,000. Both blocks cannot use the unclaimed dividend funds held for future claims.

The decision was made to jointly use the \$22,000 to fence off and riparian plant the waterway on the Tuatahi Trust. This awa is adjacent to the marae that the beneficial owners of both entities affiliate to through the same tupuna. Done in conjunction with the 50:50 grant funding arrangement with the local Regional Council, the entities have \$44,000 to invest – enough to fence both sides the entire 800 m stream length (1,600 m at \$17/m) and replant the 2.6 ha of retired land in indigenous plants, sourced from a local nursery.

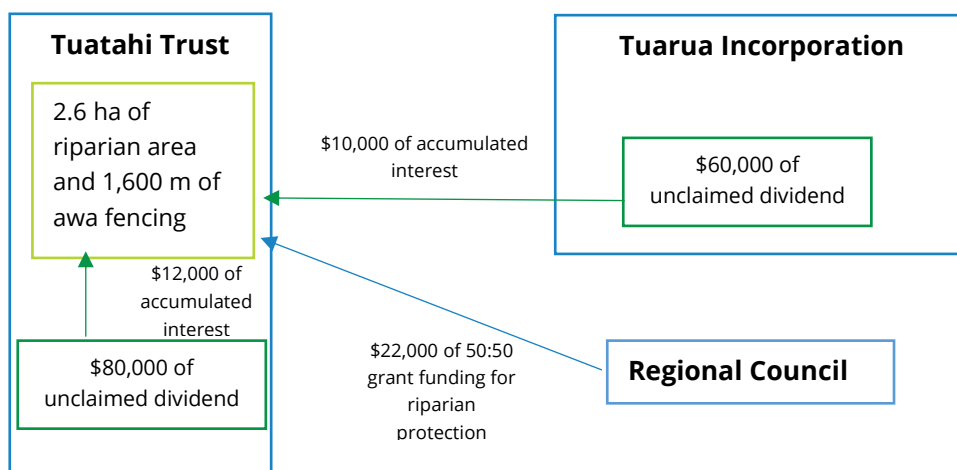


Figure 7: Case study analysis - Dividend reinvestment (whenua Māori case study)

For larger entities with potentially larger pools of unclaimed dividend, the annual interest from the investment of these funds could support larger projects. For example, the Tuawhā Incorporation, further down the coast, has over \$480,000 in unclaimed dividends – the result of being over 4,500 ha and having close to 2,300 registered owners, of whom they only have contact details for 883. Invested at 4% per annum, this pūtea is generating \$16,000 of after-tax income each year. With this, Tuawhā is retiring and planting 5-6 ha of mānuka each year. This is seeing some of their more marginal land being progressively retired from sheep and beef farming but generating NZU income and acting as a succession crop for permanent native forest regeneration.

6 Summary

6.1 Summary of financing solutions

Table 23 summarises the key financing options alongside the type(s) of land use change they are most likely to support as well as five of the key evaluation criteria. There are four land use change scenarios represented: land management change, farm infrastructure investment, partial [farm]land use change and total land use change. The five evaluation criteria that are assessed are:

- Financial returns for investors (low, medium and high)
- Investor risk (low, medium and high)
- Complexity of solution (including to access/set up and administer) (easy, moderately complex and complex)
- Certainty of environmental outcomes (extremely certain, may occur and uncertain)
- Likelihood of perverse outcomes (extremely unlikely, possible and extremely likely)

These five criteria were chosen as they represent key aspects of some of criteria ranked as most importance in the survey results. Table 23 encompasses aspects of certainty, desirable outcomes, risk/security, perverse outcomes and returns.

Table 23 demonstrates how each solution has positives and negatives. There is no one solution that is 'best' across all the criteria and the most appropriate solution will depend on the context (including what kind of land use change is required) and what they parties involved are prioritising (e.g., financial returns or environmental outcomes).

6.2 Summary of evaluation criteria

Evaluation criteria for the financing options were designed in workshops with stakeholders and ranked through a survey. These are discussed in more detail in Section 5.1. The list of evaluation criteria, in order of importance are:

- Certainty
- Desirable outcomes
- Risk/security
- Perverse outcomes
- Control
- Returns
- Scalability
- Accessibility
- Desirability
- Complexity
- Novelty

Table 23: Summary of financing options against key evaluation criteria

Ranking		Type of land use change				Financial return for investor	Investor Risk	Complexity of solution (to set up and administer)	Certainty of environmental outcomes	Likelihood of perverse outcomes
		Land management	Farm infrastructure investment	Partial land use change	Total land use change	Low Medium High	Low Medium High	Easy Moderately complex Complex	Extremely certain May occur Uncertain	Extremely unlikely Possible Extremely likely
1	New products			X	X	High	Medium	Complex	Extremely certain	Possible
1	Philanthropy and impact investment			X	X	Low	Low	Moderately complex	Extremely certain	Extremely unlikely
2	Māori to Māori investment collaboration		X	X	X	Medium	Medium	Moderately complex	May occur	Possible
2	Long term lease development partnership		X	X	X	High	Medium	Moderately complex	May occur	Possible
2	Dividend reinvestment (whenua Māori)	X	X	X	X	Medium	Low	Complex	May occur	Extremely unlikely
3	Blended finance		X	X	X	Medium	High	Complex	May occur	Possible
3	Government and regional council funding		X	X	X	Low	Low	Moderately complex	May occur	Extremely unlikely
3	Endowment fund		X	X	X	Low	Medium	Complex	May occur	Extremely unlikely
3	Pooled collectives	X		X		Low	Low	Easy	May occur	Extremely unlikely
3	Joint ventures and equity partnerships		X	X	X	High	Medium	Moderately complex	Uncertain	Possible
3	Peer to peer lending	X	X	X		Medium	High	Complex	Uncertain	Possible
4	Privately managed investment fund		X	X	X	High	Medium	Moderately complex	Uncertain	Possible
4	Farm-based listed companies		X	X	X	High	Medium	Complex	Uncertain	Possible
4	Processor incentives	X				Low	Low	Easy	Extremely certain	Extremely unlikely
4	Debt financing	X	X	X	X	Medium	Low	Easy	May occur	Possible
4	Crowd funding			X	X	Low	Low	Moderately complex	May occur	Extremely unlikely
4	Value-added products	X				Medium	High	Moderately complex	May occur	Possible

6.3 Summary of ranking of potential solutions

Table 24 summarises the ranking of each solution (which are discussed in more detail in Table 20). Potential financing solutions were ranked based on their potential to support environmentally beneficial (but not necessarily financially beneficial) land use change and their need further research or assistance. A solution listed as no further action needed does not mean that a solution is not an integral financing option, but that it is functioning well and does not need further development.

Table 24: Summary of ranking of potential financing solutions

1. Prioritise for further action	2. Potential solution but faces a big challenge(s)
New products Philanthropy and impact investment	Māori to Māori investment collaboration Long term lease development partnership Dividend reinvestment (whenua Māori)
3. Some potential but likely limited benefits	4. No further action needed
Blended finance Government and regional council funding Endowment fund Pooled collectives Joint ventures and equity partnerships Peer to peer lending	Privately managed investment fund Farm-based listed companies Processor incentives Debt financing Crowd funding Value-added products

6.4 Summary of recommended actions

Table 21 details all the recommendations associated with the highest ranked solutions. In summary the key recommendations from this work are:

- Creating a market for new products, specifically biodiversity credits, appears to be the financing solution with the most potential. However, it is incredibly complicated to create a well-functioning market like this and so it is critical that all the current conversations related to this are connected (across policy, financing and primary sectors).
- Connecting the suitable parties is a key challenge for a range of financing solutions, including joint ventures, equity partners, blended finance partners and pooled collectives. A mechanism which can help people identify partners with aligned values and needs would have benefit across these financing options. While some may not want to be public for competitive reasons, there is potentially a way to help these financing solutions be more effective by making it easier to identify potential partners.
- Government funding is critical for novel higher risk projects - this could be through grants or through blended finance models. However, these have very high transaction costs. While scrutiny is necessary when allocating public funds, a way to help reduce these transaction costs would be useful (for example a more staged application process to avoid sunk investment in complicated applications that are not successful).
- Consider investigating how non-traditional lenders (e.g., regional councils and trusts with endowment funds) could lend money within the intent of the Anti-Money Laundering and Countering Financing of Terrorism Act (2009) as there is potential for this funding model to support land use change.
- Some financing solutions (namely peer to peer lending and funding solutions such as endowment funds and philanthropic funds being leveraged through a pooled collective such as catchment groups) need to have further market research before further specific recommendations are made to further develop these solutions.

- Dividend reinvestment for whenua Māori is a solution with significant benefit but needs to have policy change with multiple owner support and/or legislative change to section 30 of the Māori Trustee Act 1953 to be readily accessible. Te Puni Kōkiri and Te Tumu Paeroa are at an early exploration stage regarding the Te Tumu Paeroa Common Fund. It is important that the potential opportunity of this is included in legislative change discussions and that these conversations are encouraged and supported by whenua Māori owners.

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1 Appendix - Barriers to land use change

OLW seeks a future where catchments contain mosaics of land uses that are more resilient, healthy, and prosperous than today. To achieve this future land use change, nature-based solutions, land use and/or changes in land management will be required. These changes are often less profitable than some existing land uses or require initial capital investment that makes the change prohibitive.

It is important to identify obstacles to land use change and capital-intensive land management change to ensure that the potential solutions are suitable to be adopted on farms. This section provides background information on change theory and barriers to change. It draws upon existing work to identify obstacles to land use change that could be overcome through novel financing solutions.

1.1 Change theory

This section summarises information from Journeaux (2009). The processes that occur when adopting innovation or implementing change are explored. While the literature refers to innovation this should be considered synonymous with change.

1.1.1 Adoption and diffusion of innovations

Diffusion of innovations is a theory that seeks to explain how, why, and at what rate new ideas and technology spread. The diffusion of innovations is defined as the acceptance, over time, of some specific item, idea, or practice, by individuals, groups, or other adopting units, linked to specific channels of communication, to a social structure, and to a given system of values or culture.

1.1.2 Innovation diffusion models

The most widely researched innovation diffusion model is one proposed by Rogers (1962) and revised by Rogers and Shoemaker (1971), which has four stages:

1. Knowledge - The individual is exposed to the innovation and gains some understanding of how it functions.
2. Persuasion - The individual forms a favourable or unfavourable attitude towards the innovation.
3. Decision - The individual engages in activities that lead to a choice to adopt or reject the innovation.
4. Confirmation - The individual seeks reinforcement for the innovation-decision they have made. Conflicting information about the innovation may cause an earlier decision to be reversed.

Rollins (1993) adjusted this to a five-step process:

1. Awareness of an innovation.
2. Interest in the innovation.
3. Evaluation of the innovation.
4. Trialling of it.
5. Assuming a successful trial, adoption.

One of the challenges with novel financial solutions is that they often have limited trialability, meaning the evaluation and decision stages become increasingly important and involved. Financial solutions are often challenging to reverse and can have significant business implications if they are not successful.

1.1.3 Pattern of adoption

Rogers and Shoemaker (1971) found (and confirmed by Rollins (1993)) that the distribution frequency of the number of adopters of an innovation over time follows a normal bell curve distribution. This distribution curve can be split into five characteristics:

- **Innovators** - Innovators are venturesome and eager to try new ideas, generally have more cosmopolitan social relationships, and often communicate with, and belong to, a group of innovators. They usually have reasonable financial resources, able to absorb a possible loss, and the ability to understand and apply complex technical knowledge.
- **Early Adopters** - Early adopters are a more integrated part of the local social system than innovators, and often have the greatest degree of opinion leadership. Potential adopters often look to early adopters for advice and information about an innovation.
- **Early Majority** - The early majority deliberate some time before completely adopting a new idea. They follow the early adopters willingly, but carefully and seldom lead.
- **Late Majority** - These are the next 34% to adopt an innovation. The late majority approach innovations with scepticism and caution, and do not adopt until most others in their social system have done so. The weight of social norms must favour the innovation before the late majority are convinced.
- **Laggards** - Laggards are traditionalists who are guided in their decisions by the past. They are suspicious of new ideas and allow a long time to elapse between knowing of an innovation and adopting it. This group often will not make change until forced to by regulators.

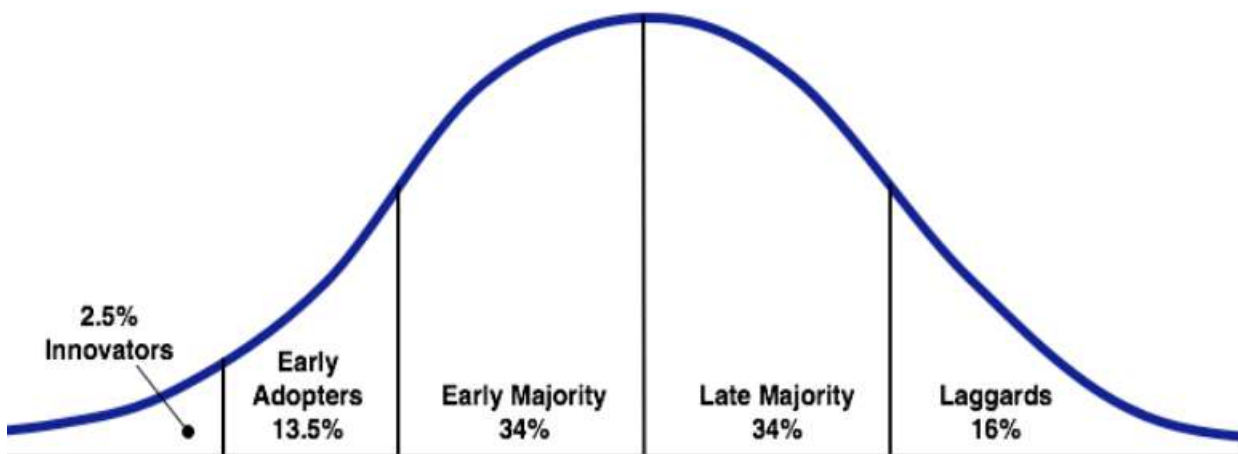


Figure 8: Adoption curve (Rodgers, 1962)

1.1.4 Characteristics of an innovation or change

There are four factors that influence the uptake of innovations or implement change.

- Attributes of the innovation.*

There are five attributes of an innovation that influence its adoption:

- Relative advantage – the degree to which an innovation is perceived as being better.
- Compatibility – the degree to which it is perceived as being consistent with existing values, past experience and needs of the individual and (in a farming context) how readily it fits within the current farming system.

- Complexity – the degree to which the innovation is perceived as relatively difficult to understand and use.
- Trialability – the degree to which an innovation may be experimented with on a limited basis.
- Observability - the degree to which the results of an innovation are visible.

ii. *Characteristics of the individual.*

This relates to the personal characteristics and circumstances of the individual – e.g., age, education, financial circumstances, goals, family circumstances, support networks, interaction with scientists and extension agents.

iii. *Characteristics of the social system.*

This relates to the structure of the social system, incorporating its beliefs, norms, values, and communication systems. For example, a traditional social system may well limited adoption of innovations, while a more open social system with well-developed technology, exposure to a range of media and ideas, and a more positive attitude to change, is more likely to support innovative behaviour.

iv. *Channels of communication.*

This is how the message travels from a source to a receiver, and there are two main channels: mass media and interpersonal. Mass media channels are relatively more important at the knowledge function level, in creating an awareness of an innovation. These channels would include TV and radio, social media, magazine articles, field days, discussion groups, seminars, and conferences. Interpersonal channels are those that involve a face-to-face exchange between two or more individuals. It allows for a two-way exchange of ideas and can be used to persuade receiving individuals to form or change, strongly held attitudes.

v. *Change Agent's role.*

The Change Agent (or advisor) functions as a communication link between two or more social systems (Rogers and Shoemaker, 1971). They have a major influence on adoption and diffusion of innovations, both through the methods they use, and their availability. Consideration of the characteristics of a possible land use change help to predict the likelihood of the innovation or change being adopted.

1.2 Barriers to change

1.2.1 Drivers and barriers to land use change

Drivers and barriers to land use change are *summarised* in Journeaux et al. (2017) as:

- Biophysical
- Soil type and soil characteristics
- Topography, particularly slope
- Climate
- Water – availability for irrigation and impact of land use system on water quality
- Economic
- Relative profitability of the land use
- Access to capital
- Infrastructure
- Markets

- Access to information
- Access to skilled labour
- Land tenure
- Technological change, which often impacts via improving profitability.
- Societal pressures and “license to farm”. This usually manifests in regulations affecting the sector, e.g., around animal welfare, food safety, human welfare, and environmental impacts.
- Personal factors. This covers the wide range of difference in individuals which may affect their thinking around land use change. It would include aspects such as age, education and experience, family circumstances, attitude to risk, access to capital, access to information, and attitude to change.

1.2.2 Social factors

The importance of social factors is emphasised by Vanclay and Lawrence (1994):

“Traditional extension has usually been a top-down process whereby scientists developed products and methods that were promulgated by extension agencies, and farmers were expected to adopt. Extension agents considered farmers who failed to adopt new techniques recalcitrant and irrational, and that farmers’ attitudes and their lack of knowledge were the main barriers to adoption. Little consideration was given to farmers’ points of view, and the idea that resistance to change might have some logical basis was seldom considered. Recent analysis reveals that most “barriers” have a rational basis and can be categorised as: conflicting information; risk; implementation costs and capital outlay; intellectual outlay; loss of flexibility; incompatibility with other aspects of farm management and farm and personal objectives; as well as social and perception issues.”

1.2.3 Relative advantage

Relative advantage is the degree to which an innovation is perceived as being better than an alternative innovation or course of action and is often expressed in economic terms (Journeaux, 2009). Research has consistently shown that the perceived financial advantages of environmental innovations are one of the best indicators of their subsequent adoption (Barr and Cary, 2000). Where there is no financial advantage from the environmental innovation or change is where the novel financial solutions explored in this research could be used to support positive environmental change.

1.2.4 Catchment level change

Property-right incentives, where rights and responsibilities are shared between the land manager and some other agency, are seen as cost effective and un-intrusive. Solving problems associated with sustainable development is not just about changing behaviour of the individual landowners, but about seeking new ways of thinking about systems, neighbours and whole farm planning. (Valentine et al., 2007).

Some land use changes are likely to be more effective when implemented across farm boundaries and catchment based. The benefit of these land use changes may be difficult to attribute to individual landowners or even specific groups of landowners. They also are likely to be more challenging to fund and require more complex structures to enable funding for example trusts to be set up with administration and governance structures. These collectives do however, open the door for additional financing options that may not be accessible to an individual.

1.3 Barriers to land use change for improved environmental outcomes

1.3.1 Capital intensity

Land use changes to support improved environmental outcomes tend to be capital intensive. To demonstrate, consider these scenarios:

- Constructed wetlands. A large, constructed wetland in the Hawkes Bay (Tukipo) cost \$350,000 to construct and plant. This wetland has an area of 1.6 ha with 180 ha catchment (HBRC, 2021).
- Retiring land from grazing incurs significant fencing costs. \$7-8,000/ha and a similar amount for planting. Loss of profit is estimated to be \$200/ha/year for North Island hard hill country (B&LNZ, 2021).
- Cow housing. There is a wide range of cow housing options, some of which can have environmental benefits. To build a composting barn or a free stall barn for a herd of approximately 450 cows (average size of a New Zealand dairy herd) could cost more than \$1m.

While some can access bank funding to support these capital developments, especially through developments in banking such as green loans (loans with favourable terms to complete specific environmentally friendly projects), others may need to look for alternative capital funds especially for more risky or unproved capital projects.

1.3.2 Economics

With environmental innovations - that is the use of techniques, methods and approaches to reduce the negative environmental impacts from land management actions - the costs of adoption are typically borne by the individual farmer, while the benefits are social. Often the costs outweigh the benefits for an individual farmer, at least in commercial terms. Such adoption is, therefore, not in the farmer's economic interest and the result is large scale non adoption. There are many other fundamental differences between environmental innovations and commercial innovations that make the adoption process of environmental management techniques much more complex, and their adoption much less likely (Vanclay, 1994).

Barriers to adoption is an important concept in dealing with environmental innovations because it recognises that some environmental management practices may not be in the best economic interests of individual farmers even if their wide scale adoption is socially desirable. A major aspect of the recognition of these barriers to adoption is the consideration of how farmers may be persuaded to change their behaviour, or in other words, how the barrier, or hurdle, might be overcome (Vanclay, 1994).

1.3.3 Complexity

Environmental innovations tend to be different from commercial innovations. Commercial innovations tend to be what might be described as add-on technologies, which require little modification to farm procedures. Appropriate environmental management in agriculture often requires major changes in land use and to farm management. It is well established that add-on technologies are far more likely to be adopted than practices that require major land use change, even where significant economic advantages can be demonstrated in the case of the latter (Vanclay, 1994).

1.3.4 Divisibility and observability

Divisibility allows for partial adoption. Farmers can adopt that part of an innovation or change that they like or that is consistent with other farming objectives. The more divisible into component parts an innovation or change is, the more likely it is to be adopted (Vanclay, 1994). Partial adoption is viewed as

a form of trial adoption. Land use changes that seek improved environmental outcomes are difficult to observe and attribute to a specific action. For example, when land is retired from grazing and allowed to regenerate this may reduce sediment losses to water ways but this very difficult to observe (by the land user) and may only be detected from water testing results over an extend period. Land use change is difficult to partially adopt. For example, the addition of off-paddock infrastructure to a dairy farm system would also encompass considerable change to the whole farm system.

1.3.5 Conclusions

The implications for the financing of land use change are firstly, the land user may be sceptical about the change and what it will achieve, secondly concerned be about the size and 'irreversibility' of this change, and thirdly see no direct benefit (to themselves) arising from this change. Under these circumstances the land user is unlikely to accept any financial cost incurred in the change. Hence, financing options where the costs are not borne (or at least reduced) by the land user are required. Unless the landowner is in a position where they do not have to worry about the financial impact of land use and land management changes and can afford to make changes based on desires and values.

2 Appendix – Case study descriptions

All case studies are hypothetical scenarios. While they are based on examples known to the researchers none represent an actual business.

2.1 Case study 1 – Sheep and beef farm

Jeff and Cynthia Hamilton are sheep and beef farmers in the Omatane district, located 25 km south of Taihape township. The couple purchased the farm 7 years ago after building up capital through Jeff shearing and Cynthia nursing while leasing farmland. Both Jeff and Cynthia's parents provided some financial support to enable the purchase of the property. The couple have three teenage children.

2.1.1 Farm description

The farm has a total area of 400 ha, comprised of 350 ha of pasture, 20 ha native bush and scrub, and 30 ha in pine plantations. Pasture area is made by 50 ha of flats and easy rolling (LUC II & I), 200 ha medium hill country (LUC VI) and 150 ha of steep hill country (LUC VII).

The pine plantations are established on steeper sideling areas including a sideling that banks the Makopua Stream which is a contributory to the Rangitikei River. The pine plantations range from 23-25 years, and it is the intention of the Hamilton's to harvest these trees in the next 2-3 years. These plantations are registered in the Emissions Trading Scheme, but due to their age at registration, the Hamilton's have not claimed any NZUs.

2.1.2 Farm system

The farm winters 2,000 Romney ewes plus replacements and 200 yearling Friesian bulls. A lambing percentage of 140% (survival to scanning) is normally achieved and all, surplus to replacement lambs, are finished to an average slaughter weight of 17.0 kg cwt. Bull calves are purchase at 100 kg LW in November and carried through to 20 months when slaughtered or sold store at 500 kg LW. Summer forage crops are grown on the flats to finish lambs over the summer.

2.1.3 Environmental impact

The Hamilton's are members of the Makopua sub catchment group which is part of the Rangitikei River Catchment Collective. Water quality monitoring of the Makopua stream has found that sediment and phosphorus are the main water quality concerns for this sub catchment.

As the pine plantations mature, some trees on the sideling areas have fallen over exposing soil to erosion and in some cases, these fallen trees have slid into the Makopua stream. On occasions these fallen trees have caused blockages in the stream causing accelerated erosion to the stream's banks. The Hamilton's are concerned about the impact these fallen trees are having on the sediment loading of the stream.

2.1.4 Proposed changes

Horizons Regional Council staff have recommended that, following the harvest of the pine plantations, 5 ha of the land bounding the Makopua stream be replanted in native shrubs and ground cover plants. The cost of replanting these 5 ha in natives is estimated to be \$6-7,000/ha compared with replanting in

pine which is estimated to be \$2,500-3,000/ha. For the total 5 ha this represents an additional cost of \$20,000 to the Hamilton's.

By replanting in native trees, the Hamiltons' will forgo the next \$25,000/ha of net stumpage at the end of the otherwise planned 28-year rotation. Furthermore, as the replanting is on land already considered "forest land" under the ETS, the ability for the new indigenous plantings to accumulate NZUs is significantly constrained. When added to the reality that the amount of carbon sequestered by native forests is considerably less than pine forests, the effective financial benefit from carbon sequestration is nil for the foreseeable future.

2.2 Case study 2 – East Coast Whenua Māori

2.2.1 Introduction

Two neighbouring whenua Māori blocks located in the East Coast of the North Island. One, the Whenua tuatahi block is 2,474.64 ha and has 1,997 registered owners. For more than 60 years this block has been a beef and sheep operation with some forestry on the more marginal, erosion prone parts. Two, the Whenua tuarua block is 2,696 ha and is managed by a Māori Incorporation which has seven members on their committee of management. For more than 60 years, this block has been mainly a dairy operation with some forestry on the more marginal, erosion prone parts.

The owners of both blocks cannot sell the land. They are kaitiaki and the whenua is taonga tuku iho that will be handed on to future generations. The kaitiaki have kaitiakitanga obligations.

The border between the blocks is the Waikaramea Stream. The health of that stream has deteriorated over the last 60 years. Whenua Tuatahi is made up of 62% LUC 7e and 35% LUC 6e, suitable for grazing and production forestry. Whenua Tuarua is made up of 50% LUC 7e, 26% LUC 6e, and 14% LUC 8e with low suitability for grazing and more suitable for production forestry and permanent carbon forests. On both blocks there is a mix of exotic grassland, manuka/kanuka and indigenous forest. Rainfall is high at 1,580 mm and 1,723 mm respectively, per year.

2.2.2 Farming operations

The overall farming footprint of both large blocks has decreased over the past 60 years. Distance from markets and low investment in infrastructure have been issues on both blocks. Key farm characteristics include:

- There is now more than 100 ha of production forest across the two blocks. There is significant indigenous forest across both blocks.
- Whenua Tuatahi Beef and Sheep operation has 250 cattle and 500 sheep.
- Whenua Tuarua Dairy operation has 260 crossbred cows are calved each in the spring and 180 cows peak milked on approximately 180 ha.
- 5 ha of turnips are grown each year for feeding milking cows in February and early March.
- The primary causes of the farm's high nitrogen loss are high rainfall and free draining soils.
- Recent practice has been to utilise low stocking rate, small amounts of imported feed, and low nitrogen fertiliser applications.

2.2.3 Potential changes

There is a need to invest in new infrastructure, including fencing, barn, and large equipment, which will require more than \$1 million for each farm.

Possible land use change options that the committee of management have considered include horticulture, more native and/or plantation forestry, and other livestock.

2.2.4 Governance

Both blocks have large governance committees and sometimes it has been difficult to make decisions because of relationship breakdowns. Knowledge of the primary industry sectors is low to medium and the committee has not sought expert advice for some time. Financial deficits have been the norm for the past five years. They have a good relationship with the farmer and most committee members are positive about agriculture on the whenua. With kiwifruit becoming successful in neighbouring communities, there have been many questions about horticulture as alternative options. A growing number of landowners are concerned about the impact dairy farming, stock and forestry have had on waterways and kaimoana.

2.3 Case study 3 - Dairy farm

Michael and Jane Smith are dairy farmers farming in the Te Rehunga district located 15 km west of Dannevirke. The farm is situated at the base of the Ruahine ranges (in the rainfall shadow). It is a third-generation farm. Michael and Jane have one son and two daughters. The eldest daughter aspires to return to the family farm with her partner and take over the operation of the farm as managers for 2-3 years, then 50/50 sharemilk and ultimately purchase the farm from her parents. Michael and Jane wish to keep the farm in the family too but also want to be fair to the other two siblings.

2.3.1 Farm system

The farm has a total area of 85 ha, and 80 ha is milked off. The remaining area is taken up by housing and other building infrastructure, and a stream that is fenced off from livestock, making up 2 ha.

The predominant soil type is Dannevirke silt loam, a free draining naturally fertile soil. Rainfall is high at 1,500 mm per year. Key farm characteristics include:

- 190 crossbred cows are calved each in the spring and 185 cows peak milked.
- The farm is operated with a low stocking rate of 2.3 cows per ha, the cow breed is Kiwi cross.
- Total milk production is 75,850 kg MS, equating to 410 kg MS/ha and 950 kg MS per effective ha.
- 40 replacement heifers are grazed off farm from May 1 to April 30.
- 100 cows are grazed off farm for 6 weeks in the winter.
- Approximately 200 kg/cow of PKE is the only purchased feed and all other supplements are made on farm.
- 7-8 ha of turnips are grown each year for feeding milking cows in February and early March.
- 80 kg nitrogen is applied per hectare each year.

2.3.2 Environmental impact

The farm has been modelled in Overseer and the nitrogen loss to water is estimated to be 45 kg N/ha. The Smith's farm is in a priority catchment under Horizons One Plan. To be granted a land use consent, farms in these priority catchments are required to comply with nitrogen loss limits set out in Horizons One Plan. Most of the Smiths' farm is mapped as LUC II and hence the maximum nitrogen loss limit is 27 kg N/ha in year one and reducing to 21 kg N/ha by year 20. This represents a 40% reduction from the farm's current nitrogen loss in year one and a further 13% by year 20. The primary causes of the farm's high nitrogen loss are high rainfall and free draining soils.

There are the following options to mitigate nitrogen loss:

- Good management practice. Current practice is good the farm has low stocking rate, small amounts of imported feed and low nitrogen applications. Small modification can be made such as the removal of nitrogen fertiliser and the replacement of PKE. Both of these feed sources could be replaced with a lower nitrogen supplement (maize silage). Plantain could also be introduced to the pasture sward. These modifications will achieve incremental reductions in nitrogen loss and insufficient to reach required nitrogen loss limits.
- Off Paddock Infrastructure - This will require significant capital investment, possibly as much as \$500,000. The Smiths don't want to take on additional debt at their stage of life and don't want to encumber the business with more debt that may constrain their succession plan with their daughter.
- Land use change - Possible land use change options include horticulture, trees and other livestock.