Investment approaches to land use change in Upper Waipā River catchment

Feasibility Assessment Report

July 2017

ENVIROSTRAT CONSULTING LTD

Executive Summary

This report investigates the feasibility of impact investment as a means of addressing significant environmental challenges in the Upper Waipā catchment, whilst delivering a positive financial return on investment.

Impact investment, and specifically conservation investment – which refers to investments made with the intention to generate a return while also delivering a positive impact on natural resources and ecosystems - has been growing significantly in recent years. Globally, between US $30 – 50 billion has been committed to conservation investment projects, a large proportion of which comes from the public sector with approximately US $8 billion in commitments from the private sector. The financial returns from conservation investments are typically between 5–10%; only a very small proportion of projects default and most perform over expectations financially.

In New Zealand, investment in conservation needs to increase if we are to address ecosystem degradation, particularly water quality issues, biodiversity loss, and respond to climate change. The challenge is to be able to leverage public investment to attract new capital to invest in scalable solutions for sustainable land use management. There is interest from New Zealand and international investors to potentially invest in viable conservation projects in New Zealand.

Two areas are promising as investment pilots in the upper Waipā catchment targeted in this report: (1) afforestation[1] of steep hill country, predominantly used for dry stock farming, and (2) conversion of conventional dairying to organic. Detailed economic-environmental analysis shows that by targeting land use change in only 5% of the target area (6,539 ha out of the total 130,351 ha – currently 3,484 ha of beef and sheep and 3,055 of dairy land – all of which has high environmental outputs for sediment, *E.coli* and nitrogen), a significant cumulative reduction of environmental outputs can be achieved while financial performance remains viable as follows:

For dairy:

- 6-7.7% reduction in dairy-based sediment and *E.coli* for the entire target dairy area (32,830 ha), depending on the mitigation options considered.
- 2-4% reduction in N, P, and greenhouse gas emissions.

[1] Afforestation in this study targets a range of outcomes: timber (pine and redwood) and manuka honey.

- If the payout for organic milk is $7/ kg MS, there is a 6.2-11.3% loss in annual operating profit relative to 'conventional' dairy, depending on mitigation implemented; the breakeven payout is $7.35/ kg MS.
- If the payout is $9.20/kg MS (current payout by Fonterra for organic milk), there is a 55-64% increase in annual operating profit, depending on mitigation implemented;
- The discount rate used was 6%, and annualized estimates were based on a 30-year operation.

For land currently in beef and sheep farming:

- 12-22% reduction in beef & sheep-based *E.coli*, sediment and nitrogen in relation to the entire Upper Waipā dry stock area economically feasible for afforestation (16,274 ha).
- Depending on the afforestation scenario (which were derived from a separate study – *Waipā Afforestation Feasibility Study*), the operating profit can increase by an order of magnitude, 2.25 to 3.4 times more compared to current average sheep and beef farm profit ($238/ha).
- The discount rate used was 6%, and annualized estimates were based on a 30-year operation.

Interventions on these 6,539 ha across both dry stock and dairy land uses could collectively reduce the sediment load of the entire Waipā catchment by 4.3%, and the Waikato River catchment by 1.8%.

In both cases, the net present value is positive and internal rate of return is in excess of 5%, which is within normal parameters for global conservation impact investment. It should be noted, however, that the scope of this report does not include a cost of capital component, and that such costs may be significant, given the high cost of land in New Zealand. More detailed financial assessment would be required to better understand how the cost of capital may affect the overall findings of this report.

Nevertheless, these are encouraging results and several potential models have been explored in this study for progressing an impact investment opportunity.

A potential model to achieve this through a market-based approach may be a hybrid structure involving a consortium of investors (e.g. Waikato River Authority, iwi, public investment funds, high net worth individuals and foundations) that provides the capital to purchase land to then be leased to operators under specific agreements (such as organic dairy conversion and operation) and the government (central or regional) could pledge credit support to the lease payments by guaranteeing a minimum payment amount while creating legal obligations to demonstrate a positive environmental outcome.

We recommend that on the basis of the findings of this feasibility study, the initiative moves to the next steps in the investment pathway:

I Continue with the Upper Waipā as a pilot, and create an investable project, with the core elements of land owners and other stakeholders, investors, structure, and project development all advanced to the point of allowing significant investment in the upper Waipā Catchment to occur. This will involve enhanced coordination within WRC and WRA to ensure alignment of goals and vision, followed by an outreach strategy at regional and national level (land owners, farm organisations, MfE, MPI, trusts and foundations).

II Undertake further catchment-wide (or potentially region-wide) analysis to determine the potential scale and opportunities available to impact investment projects. A clear message from the investor community is that larger projects are preferable to smaller scale, so if it were possible to identify similar projects that could be executed alongside the Upper Waipā, it may prove a more attractive investment proposition.

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Background

The upper Waipā is a highly modified catchment that makes a significant contribution to the sedimentation and nutrient load of the overall lower Waikato and Waipā River catchments (58% of sediment and respectively 49% of nutrient)[2]. Water quality and biodiversity continues to decline in the Waipā River catchment and measures to date at farm and catchment level (including actions by landowners, iwi, environmental groups and the Waikato Regional Council (WRC) and the targeted investment of Waikato River Authority (WRA)) have generated localised environmental improvement.

Traditional solutions to mitigate and improve ecosystem services (including soil conservation, biodiversity or water quality improvements) on productive land are often not cost effective when land use, land capability and topography are not aligned, or when efforts lack scale and / or valuation of ecosystem services is lacking. A greater rate for improvement of water quality and overall environmental performance is required in the face of land use intensification, climate change and continuing loss of biodiversity.

The priorities set in the *Healthy Rivers Wai Ora Plan Change 2016* place obligations on land owners to start managing their land towards achieving specific receiving water quality limits. If not managed in a timely and effective way, such limits will ultimately impact on the opportunity for the agricultural sector to make a return and on its social 'license to operate'.

Objectives

This report investigates the feasibility of impact investment as a means of addressing significant environmental challenges in the Upper Waipā catchment by changing land use and/or land management practices, whilst delivering a positive financial return on investment. The specific objectives are:

- To investigate suitable operating models to attract and facilitate investment in land use change.
- To identify and value revenue streams from land use opportunities that will conserve, restore and rehabilitate selected water quality ecosystem services.
- To work with stakeholders and experts to develop an appropriate impact assessment framework to guide impact investment.

[2] For more information, see Table 7 or http://motu-www.motu.org.nz/wpapers/17_10.pdf

This project will build on the environmental enhancement projects that have been identified and prioritised through the *Waikato River and Waipā River Restoration Strategy*, and the *Waipā Catchment Plan,* both led and co-funded by WRC and the WRA, and the *Local Indigenous Biodiversity Strategies* (LIBS) pilot project led and funded by WRC. The project is complementary to, and will use and expand on outcomes of the *Waipā Afforestation Feasibility Study* by looking at additional land use opportunities which are not-forestry related and by assessing impacts across a range of ecosystem services.

Impact investment at a glance

History and trends

What is impact investment?

Impact investment as an approach to 'mindful investment' has existed for a long time – starting with the history of the Quaker movement in the U.S. that rallied against profiteering from slavery to the more recent focus on microfinance as a way of tackling social issues through entrepreneurial solutions. There is now significant evidence that profit-seeking investments to address social and environmental issues are moving from niche initiatives by alternative investors to the activities of mainstream financial institutions.

The term 'impact investing', was coined in 2007 at a meeting organised by the Rockefeller Foundation[3] to recognise the intentional placing of capital in businesses and funds that generate social and/or environmental good and at least return nominal principal to the investors. The definition of impact investment, however, is still evolving and continues to be the subject of debate for investors and leading players. One of the definitions most commonly referred to is proposed by J.P. Morgan, the Global Impact Investing Network (GIIN) and the Rockefeller Foundation:

"investments intended to create positive impact beyond financial returns"

This definition highlights several core aspects:

- Combining financial and non-financial returns;
- The requirement for investors to be intentional in their efforts to generate both financial and non-financial returns;

[3] https://www.forbes.com/sites/rahimkanani/2012/02/23/the-state-and-future-of-impact-investing/#1d78603ed488

- Linking investor intent and downstream investment impacts.

The 2009 report "*Investing for social and environmental impact: A design for Catalyzing an emerging industry"* by Monitor Institute was the first baseline analysis about the nature and scale of impact investing in the U.S. and beyond. The report confirms that the impact investing 'industry' had reached a new growth point and identifies four factors that have converged to generate new activity in impact investing:

- Broader considerations of risk in investment decisions, triggered by the 2008–2009 financial crisis;
- Growing recognition that existing resources are insufficient to address severe poverty, inequality, environmental destruction and other complex, global issues;
- An emerging set of activities demonstrating that it is possible to finance scalable business models that create social and environmental value; and
- The transfer of wealth in industrialised countries to a generation of high net worth individuals seeking to "make a difference" in the allocation and distribution of their financial capital.

The inference is that if leaders in the industry can sustain the growth and further scale up, the impact investing industry could evolve to capture the value of the marketplace and benefit from the entrance of mainstream investors.

Actors and investment levels

The impact investing industry is broad and operates on a spectrum: from not-for-profit organisations that are seeking ways to further their mission and impact intent (non-financial and/or financial), to conventional investors that may or may not have an impact intent beyond finances, through to investors that are driven by a desire to achieve a direct and indirect impact. A generalised grouping is provided below.

Table 1. Impact investing spectrum.

	Investor type	Screening approach	Impact intent	Return expectations
Philanthropy	Charities	Missions and compliance	Full	None

	Investor type	Screening approach	Impact intent	Return expectations
	Strategic philanthropies	Impact effectiveness	Full with leverage[4]	None to low
	Venture philanthropies	Impact scalability	Full with leverage	None to low
Investing	Sustainable investor	Positive Environmental and Social Good (ESG) screening + financial	Modest	High
	Socially responsible investor	Negative ESG screening +financial	Neutral	Maximised
	Financial investor	Financial	None	Maximised
Impact investing	Direct impact	Impact first, then financial	Significant	Moderate
	Indirect impact	Financial first, then impact	Some	High

Source: Brian Walsh (All things impact), Scott Lawson (SOW Asia), and Laurie Lane-Zucker (Impact Entrepreneur), 2012. Presentation to University of Portland Impact Entrepreneurs conference.

In addition to the diversity of investor types, there is an increased diversity of actors across the entire value chain of impact investing, which is testimony to the growth and complexity of the sector.

Table 2. Actors in the Impact Investing Industry.

Asset owners	Asset managers	Demand-side actors	Service providers
High net worth individuals/families Corporations Governments Employees Retail investors	Investment advisors Fund managers Family offices Foundations Banks Corporations	Corporations Small and growing businesses Social enterprises Cooperatives Microfinance institutions	Networks Standards-setting bodies Consulting firms Non-governmental organisations Universities

[4] Leveraging could be for instance about furthering their mission.

Foundations	Venture funds Impact investment funds / intermediaries Pension funds Sovereign wealth funds Development finance institutions Government investment programme	Community development Finance institutions	Capacity development providers Government programmes

Source: *Accelerating Impact: Achievements, Challenges and What's Next in Building the Impact Investing Industry*, 2012. Rockefeller Foundation.

The Global Impact Investing Network's (GIIN) most recent survey of impact investors[5] in 2016 shows a continuous growth of the sector estimates that collectively, respondents to its survey have reported USD 116.2 billion in capital committed for impact investments since inception (pre-1995), at an average of USD 735 million and median of USD 87 million per year. For more information regarding the type of investors, assets under management and type of instrument used, see Appendix 1.

A closer look at investment in conservation

Within the broader impact investing field, conservation impact is of particular interest and has relevance to the Waipā feasibility work given the focus on water quality and biodiversity. Furthermore, it is important to look at conservation investment more closely since it is an area in which public sector investment continues to be much larger in scale than private sector investment. There is strong interest to shift that balance towards more private investment since public investments are not always sufficient to deal with the challenges.

Conservation finance has been defined by Credit Suisse, WWF and others as:

"a mechanism through which an indirect or a direct financial investment is made to conserve the values of an ecosystem for the long term"[6].

JP Morgan and The Nature Conservancy refer to conservation impact investment as:

[5] Annual impact investor survey 2016 (GIIN).

[6] *Conservation Finance From Niche to Mainstream: The Building of an Institutional Asset Class.* Credit Suisse & co, 2016.

"*investments intended to return principal or generate profit while also driving a positive impact on natural resources and ecosystems"*.

Both definitions assume conservation impact cannot be a co-benefit of an investment made solely for financial return, but rather needs to be the motivation for making the investment in the first place. This is an important distinction to make from the concept of socially responsible investment and investment in general (see the impact investment spectrum above).

In the 2016 report *"Conservation Finance from Niche to Mainstream: the Building of an Institutional Asset Class",* a working estimate of the total capital expected to be invested in the global conservation finance market by 2020 was calculated by Credit Suisse and partners. The calculations were based on the current and expected market sizes of the mature submarkets such as sustainable forestry and agriculture, and average turnovers expected for the agriculture and forestry sectors. The total investment potential in conservation market between 2016 and 2020 is estimated to be very large, at around US$ 200 - 400 billion. Current estimates suggest that only around US$ 50 billion is invested every year, leaving a significant finance gap to be captured when the upper level (400 billion) is considered.

There are no such estimates available for New Zealand but it is widely accepted that significant investment is required to deal with the country's freshwater, marine and conservation challenges, including the aspiration for the country to become predator free. Current government allocation for conservation for the 2017/18 financial year is NZ $466 million[7]. There is concern that in real terms, the conservation budget and specifically the amount of money allocated to core biodiversity conservation, the underfunding since 2008 adds up to a total of NZ$132 million[8]. The pressure to attract new investment for conservation is further compounded by the need to deal with wider ecosystem degradation issues, particularly water quality issues, and respond to climate change.

Drivers for investment and activity

While conservation finance is less developed as a market, the investment in conservation globally is increasing due to a range of factors:

[7] See https://www.budget.govt.nz/budget/pdfs/estimates/v3/est17-v3-conser.pdf.

[8] See explanations by DOC and Forest & Bird http://www.doc.govt.nz/news/issues/docs-budget-2017-explained/ http://www.forestandbird.org.nz/what-we-do/publications/media-release/budget-delivers-12-million-less-native-wildlife, accessed on 9 June 2017.

- Increased interest in conservation finance from institutional investors due to low-interest rates globally.
- The Paris Climate Change Accord has led to a renewed interest in afforestation and sustainable land management, including the establishment of a Green Climate Fund,which made its first commitments in 2015 to a first set of eight projects and in 2016 to a second set of projects.[9]
- The adoption in 2015 of a set of 17 Sustainable Development Goals (SDGs) ranging from the eradication of global poverty to the conservation of the world's oceans and marine resources, each with targets to be met by 2030.[10]
- A stronger pipeline of projects in the conservation space that maintains and strengthens investor interest.
- New knowledge and experience with impact metrics, including new technology for measuring impact (remote sensing, GIS etc).
- Increased collaboration between not-for-profit and public organisations with private investors to remove barriers to flow of private capital, through practices such as first-loss capital or first-out.

Many of these factors are relevant to New Zealand too, including the Waikato/Waipā context where there is a focus on project identification (pipeline) and impact metrics ie. metrics measuring the financial and non-financial performance of the investment, combined with an interest in understanding the impetus provided by an interest in carbon credits.

Conservation investment facts and trends

One of the key initiatives that tracks private investment in conservation is under the platform of Ecosystem Marketplace[11], which collects data and carries out surveys of participants in impact investment with an expressed interest in conservation. Their most recent study *State of Private Investment in Conservation 2016: A Landscape Assessment of an Emerging Market 2016* (the EMP study) is building on the initial 2014 assessment and brings new insights into the size, scope, and trends of

[9] While most projects under GCF related to conservation have received grant money instead of loans, the Fund made its first equity investment of $35M in October 2016 into Althelia Ecosphere's Madagascar Sustainable Landscapes Fund: https://althelia.com/2016/10/14/press-release-madagascar-sustainable-landscapes-fund/.

[10] These goals apply to both developing and developed world. For more information, see United Nations' https://sustainabledevelopment.un.org/post2015/summit.

[11] Authors and sponsors of this work NatureVest, Encourage Capital, The David and Lucille Packard Foundation, the Gordon and Betty Moore Foundation, Credit Suisse and JPMorgan Chase.

investments in sustainable forestry, agriculture, fisheries, habitat, and water.[12] There are three broad categories of investment being tracked - sustainable food and fibre, habitat conservation and water quality and conservation; while recognising that actual investments can be relevant to more than one category. The EMP study does not cover renewable energy, energy efficiency, bioenergy, or water and energy infrastructure. The table below provides an overview of sub-categories for investment most commonly used.

Table 3. Conservation investment categories breakdown.

Sustainable food and fibre	Habitat conservation	Water quality and conservation
Sustainable agriculture (area with most growth)	Mitigation banking (highest growth)	Water credits trading (e.g., water temperature, quality)
Sustainable farmland management	Land easements	Water rights trading (highest growth)
Sustainable aquaculture	Direct land ownership	Watershed protection
Other restoration of large landscapes (grasslands, forests, etc.)	Other land-based funding mechanisms such as REDD+	Other
Wild-caught fisheries		
Sustainable forestry/timber		

The EMP study estimates that the total private capital committed to conservation from 2004 to 2015 is USD 8.2 billion, of which USD 2.0 billion was committed within the last two years (2014 and 2015). To put this in perspective, the GIIN report recorded USD 15.0 billion in capital committed to impact investments in 2015 alone.

However, public investment in conservation between 2009–2015 tracks at USD 31.7 billion, with USD 4.7 billion being invested in 2015 alone. Public investment includes investments from government investment banks and development institutions, including specific facilities and funds such as the UN's Green Climate Fund and the Land Degradation Neutrality Fund. For more information regarding capital committed to conservation investment and the contribution of public and private sector, see Appendix 2.

[12] Data for the study was collected through direct surveys of 128 organisations (banks, funds, companies, NGOs, family offices) that are directly investing in conservation.

Return on investments

There are a wide range of factors that have an impact on return on investment, such as the investment category and asset class, investment stage, region, financial mechanisms used or investor type.

The EMP study shows that the average internal rate of return (IRR)[13] for the US$7.5 billion committed from 2009 to 2015 is between 5 - 10%. This is confirmed by the GIIN report too, where market rate investors in developed world markets have reported a mean gross expected return of 6.6% when debt is involved, and 13.6% for equity.

Non-for profit organisations in the EMP study are likely to place most of their capital commitments (83%) in investments with IRR under 5%. As expected, for-profit organisations have reported that the greatest proportion of their capital commitments (64%) are in investments with projected IRR of 5-10%, with a quarter of investments aimed at 10-15% return and only 6% of capital aimed at IRR less than 5%. The differences of capital committed over the years for different IRR (especially those observed in 2014/15) are a result of factors such as project pipeline/investment opportunity but also decisions by significant investors such as DFIs to commit significant amounts to a particular investment category in a single year. However, the growth observed in sustainable food and fiber is expected to continue in the short term.

Table 4. Overview of proportion of capital committed by IRR.

Investment category	Projected IRR and % of capital committed by investment category 2004-2015											
	Under 5%			5-10%			10-15%			Over 15%		
	2009 - 2013	2014	2015	2009 - 2013	2014	2015	2009 - 2013	2014	2015	2009 - 2013	2014	2015
Sustainable food and fibre	17%	26%	6%	51%	27%	91%	32%	37%	2%	1%	9%	1%
Habitat conservation	33%	10%	79%	33%	54%	15%	16%	6%	-	18%	30%	5%
Water quality and quantity	3%	6%	2%	33%	1%	15%	4%	-	-	-	-	-

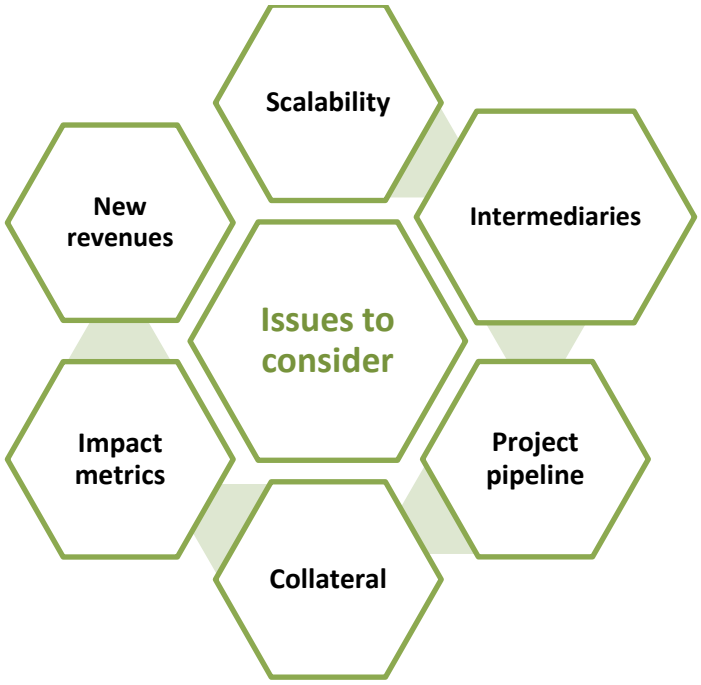
[13] Internal rate of return (IRR) is the interest rate at which the net present value of all the cash flows (both positive and negative) from a project or investment equal zero. Internal rate of return is a very common metric used to evaluate the attractiveness of a project or investment.

Source: Data adapted from *State of Private Investment in Conservation 2016*[14]

Key issues to consider

With the potential of the conservation investment market to grow and enter mainstream investment, there has been more focus on understanding the key issues that need to be considered to achieve scale and capture the investment potential[15]. These issues are not typically faced in conventional investment, where the market (demand and supply) is well developed, risks are understood and performance metrics are well developed.

Figure 1. Overview of issues to consider in impact investing.



[14] The data in this study is collected by way of a survey. There is not an equal number of respondents across all investment categories (sustainable food and fibre, habitat conservation, and water quality and quantity), and therefore the data is not 100% reliable. However, this does not diminish the overall evidence that the average IRR is between 5 and 10%.

[15] See for instance Credit Suisse, WWF, and McKinsey & Company (2014). *Conservation Finance – Moving beyond donor funding toward an investor-driven approach*. or Credit Suisse (2016) *Levering ecosystems: A business-focused perspective on how debt supports investments in ecosystem services.*

A few of the issues to consider in conservation finance taking a demand and supply approach, are addressed below; the list is not comprehensive but rather aimed at being concise and relevant for early stage project development as pertaining to the upper Waipā context.

Scalability and replicability

One of the key challenges in conservation investment (as highlighted by investors) is project scale and potential to replicate.[16] Many of the conservation projects – especially those supported by the private sector – continue to be small in scale and not set up with the same focus on return/impact maximisation and replication as are traditional business models. This restricts the interest and potential of the private sector to develop appropriate financing structures and respond to demand to finance projects with measurable conservation outcomes. This is why the sub-catchment-wide approach taken in Waipā and the requirement for projects to be replicable represents a tactical strategy to pursue scale and attract investors.

Intermediaries

During the 2016 NZ Impact Investment Forum, many of the experts raised the challenge faced by New Zealand but also globally regarding the need for intermediaries with adequate capacity and capability to connect the sources of finance (supply side) and those developing the projects on the ground (demand side). Specifically, scaling up conservation projects into investable programs will require organisations and skills that can foster best practice and replication to bring mainstream capital into impact investment[17]. The role intermediaries can play is wide ranging, from preparing project documentation, aggregating information to reduce due diligence costs for smaller investors or tracking information regarding IRR. Equally important is the role of intermediaries in developing environmental and social performance metrics that are applied and reported on with integrity. It is therefore incumbent on those interested to progress impact investment to support and work with organisations that can play an intermediary role before financial brokers or banks enter this field.

Project pipeline

[16] See for example Credit Suisse, WWF, and McKinsey & Company (2014). Conservation Finance – Moving beyond donor funding toward an investor-driven approach.

[17] See World Economic Forum http://reports.weforum.org/impact-investment/5-recommendations/5-5-role-of-intermediaries/

Investors, both public and private, have consistently expressed concern about the flow of early-stage projects that can enter the 'pipeline' and be ready for investment. The GIIN report shows that the majority of respondents noted a lack of deals with appropriate risk/return profiles as the main challenge to growth in conservation investments. The second most important challenge is the lack of deals with a management track record, followed by small transaction size as a constraint (see scalability and replicability section above). These are aspects that have been considered in the upper Waipā project, by focusing on understanding operational profits and cash flows to address risks to project viability and pipeline development. For conservation projects, technical development assistance and incubator approaches are some of the solutions proposed.

Collateral[18]

Insights to date suggest that collateral (and stable cash flows) is a common risk strategy used in private conservation finance, particularly for sustainable food and fibre and habitat conservation categories and when debt is used as a financial mechanism[19]. Understanding early on in the process of project development what assets could be used as collateral is important as it can inform the investment mechanism, reduce financing costs and influence the business model.

There seems to be a preference for real assets as collateral such as land or timber on the balance sheet – which suggests that a model to be considered for Waipā is to purchase land to present as collateral.

Impact metrics

Developing appropriate impact metrics to assess the financial and non-financial performance of impact investments is a key challenge and a focus for participants in impact investment. GIIN has developed a publicly available catalogue of metrics to measure the social, environmental and financial performance of an investment.[20] Developing assessment approaches that can be applied across a range of conservation projects and enable meaningful measurements of impact remains a challenge in this field, particularly when trade-offs between financial return and non-financial impacts are considered, and also when impact on the ground requires significant biophysical data with wide geographical and time spans.

[18] Collateral is a property or other asset that a borrower offers as a way for a lender to secure the loan. If the borrower stops making the promised loan payments, the lender can seize the collateral to recoup its losses (Investopedia).

[19] See Credit Suisse & co, 2016. Conservation Finance From Niche to Mainstream: The Building of an Institutional Asset Class.

[20] The metrics database is available at https://iris.thegiin.org/metrics

In the light of this, the Waipā feasibility project has applied an ecosystem services approach in the development of an investment matrix that reflects objectively on what needs to be measured and how.

Scaling up through market based instruments

As highlighted above, conservation finance still lacks the involvement of mainstream investors (including private investors) and public investment significantly out-weighs private investment. There is strong interest globally in increasing private investment to complement and leverage public investment in order to respond to the increasing conservation challenges and to capture the investment potential it offers.

This chapter takes a closer look at market based instruments which inform the possible solutions for the Waipā context. The aim is to highlight different instruments and options that would involve the private sector in the quest to achieve results at scale.

Financial instruments

Some of the main financial vehicles used in conservation finance market are equity (private and public), bonds (EMP 2016), and notes issuing[21]. Equity funds seem to be a preferred approach as they enable project and cash flow aggregation into a single financial vehicle. This may be a suitable approach for Waipā as well – since the focus is on two main case studies (organic dairy and afforestation) that require aggregation to achieve scale. Below is an overview of prevalent market based instruments relevant for conservation finance.

Table 5. Commonly used market-based instruments.

Market based instruments / financial vehicles	Comments	Advantages	Disadvantages
Equity – private funds	Allows for project aggregation into one fund Fund invests in equity	Reduction of transaction costs	Less visibility on projects compared to direct investment
Equity – private	Direct investment in equity	Attractive for investors as they reap the benefits	High risk

[21] See for instance the Nature Conservancy' Nature Notes, which enabled TNC to raise $US 20 million for an investment that channels capital to conservation-critical lands and waters to projects around the world. https://www.nature.org/about-us/conservation-note-fact-sheet-2016.pdf

Market based instruments / financial vehicles	Comments	Advantages	Disadvantages
			Not suitable mechanism for projects with modest / low market return
Hybrid debt/equity	Project aggregation and investment in equity and debt	Reduction of transaction costs	Visibility of individual projects can be low
Debt – loans	Direct lending to specific project or organisation	Simple transparent product	High transaction costs and not attractive for projects with modest/low market return Possibly high concentration risk for lender Collateral/balance sheet by borrower required
Debt – bonds	This requires relatively large deals (US $100M or more) Increasing experience in the market with green bonds	Simple product – commonly used in social impact investing (e.g. affordable housing) Cheap source of financing	Good rating of issuer required Requires knowledge how to bundle projects to achieve scale
Debt – notes	Not tied to specific projects but rather a theme Issued with recourse against the organisation	Investments can be small since they are not tied to specific projects Fixed income (albeit usually modest) for investor	Reputation of issuer is very important

Source: Credit Suisse 2016

For most of the instruments above, a key prerequisite is the need for scale. This often requires skills and knowledge to bundle projects together based on their risk / return profile, to aggregate and monetise cash flow, and use it as collateral to reduce financing costs.

Strategies for reaching scale: bundling of projects

Bundling of projects to achieve scale is a common approach in conventional financing, where it is predominantly (but not solely) used for projects that have a similar focus and management approach.

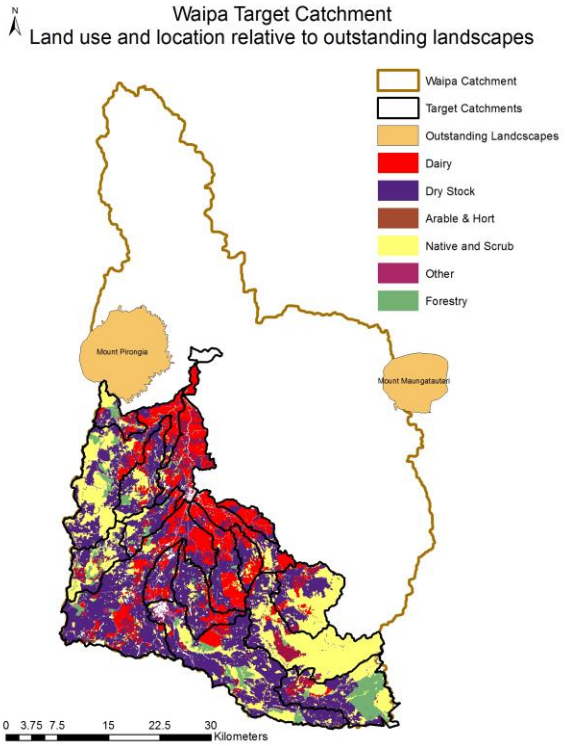
The Credit Suisse report exploring how to turn conservation finance into an asset class suggests two strategies for reaching scale and addressing some of the barriers to conservation investment such as high transaction costs (see table below). Both approaches have strong merits and the heterogenous approach (diverse portfolio of projects) is suggested as a potential option for Waipā not just to achieve investment scale but also to give effect to the catchment approach for enhancing ecosystem services and achieving multiple outcomes.

Table 6. Example of project approach for scaling up.

Homogenous projects	Heterogenous projects
e.g. Restoring farmland, forestry, eco-tourism	**e.g. Certified agricultural products, carbon credits, water rights**
Replicate and scale up the same project management approach Aggregate and raise equity or debt Projects are similar in terms of size, same geography/catchment The market for the product is developed (certified product, user fees) so there is stable cash flow	Diverse portfolio of projects which are complementary and preferably target the same geography (sustainable agriculture, eco-tourism, forestry at catchment or landscape level, regional parks) Match investors (need to understand return-risk-impact) Aggregate projects by risk/return into a single product Significant capabilities in structuring and project development Opportunity to bundle projects with diverse cash flows at ecosystem or landscape level

Conservation needs and priorities in the upper Waipā catchment

Overview of the Waipā



Since 1840, large scale conversion of forested areas into pasture and the drainage of wetlands has decreased the natural integrity of the upper Waipā catchment. The Waipā Catchment itself covers 306,569 ha with the primary landscape feature being pastoral land. Aside from farmland and steep hill country, the remaining land is mostly associated with residential and small townships including Ngaruawahia, Pirongia, Te Awamutu, Otorohanga, and Te Kuiti. Patches of the original landscape remain intact such as remnant indigenous vegetation, the peat lakes and wetlands which provided key habitat for native species and important ecosystem services. Protection of these remnant ecosystems offers a foundation upon which the restoration of historical habitats can be built, and also provides an environmental benchmark to track progress.

Soil conservation:

The erosion of the soft geology in the Waipā is responsible for 40% of the total sediment load the Waikato River (Motu 2017). The principal mode of sediment introduction to the freshwater ways of the Region comes from stream bank erosion, a process that is exacerbated by the movement patterns of livestock along the waterway margins. Episodic small-scale landslides and the large Tunawaea Stream landslide (which occurred in 1991) also significantly contribute to soil erosion in the area. These gradual and intermittent losses of fertile soils transport valuable terrestrial nutrients (phosphorus) into the waterways, ultimately reduce the productive potential of land and contribute to declining water quality. The goals to restore the environmental integrity of the catchment encompass the soil erosion targets set out by the Waikato Regional Council, and is therefore a ‘kill two birds with one stone’ scenario.

Native vegetation

Native forest in the region is largely limited to the elevated, steeper sloped areas of the Upper Waipā where agricultural practice is not as prevalent (Waipā Catchment Plan 2014). Although this area might have the largest remaining stands of native vegetation, the gradual expansion of agriculture places these forests at risk. Conservation of the native forest is not limited to simply preventing the expansion of pastoral farming however, according to Burns et al. (2011) supplementary management of the edge effects and actions to enhance connectivity between stands is vital in order prevent on-going ecological decline and to restore other aspects of the ecosystem.

Fisheries

The Waipā and Waikato Rivers and its tributaries have traditionally supported fisheries, providing culturally important kai species such as eels, koura, and lamprey as well as water plants like watercress. The decline of the local waterways is the cumulative result of many separate factors including the removal of riparian vegetation and wetlands, commercial discharge, reduced connectivity between water bodies, introduced species, and overfishing[22]. Dairy intensification (including increased drainage) has had a pronounced effect by introducing excessive nutrient loads and animal effluent to waterways which have undoubtedly contributed to the decline in fisheries by lowering water quality. Of particular significance is the existence of a relic lamprey population in the Upper Waipā, the last remaining (known) population of these primitive fish in the Waikato. The conservation of some 19 native fish species including the commercially important whitebait is a key aspiration of the local whānau, serving to increase the mana of the tangata whenua and the river itself through kaitiakitanga principles[23].

Lakes, wetlands and rivers:

The peat lakes and one riverine lake located in the Upper Waipā are all in the midst of expansive pastoral catchments and have subsequently lost most of the wetland habitat around the lake margins. By the 21st century 87% of wetland environments across New Zealand had been removed[24], most of it from the North Island. This habitat is critical to many plant, native fish, invertebrate, and bird species, and provide important ecosystem services such as nutrient removal, flood mitigation, and trapping sediment. Equally important is the restoration of river water quality, which is significantly compromised by the existing

[22] *Waikato River Independent Scoping Study.* NIWA 2011

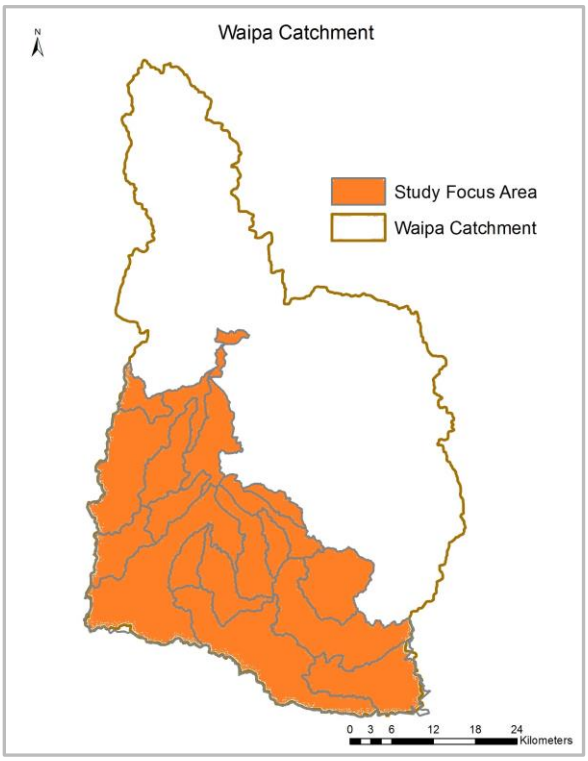
[23] Maniapoto priorities for the restoration of Waipā river cactchment.

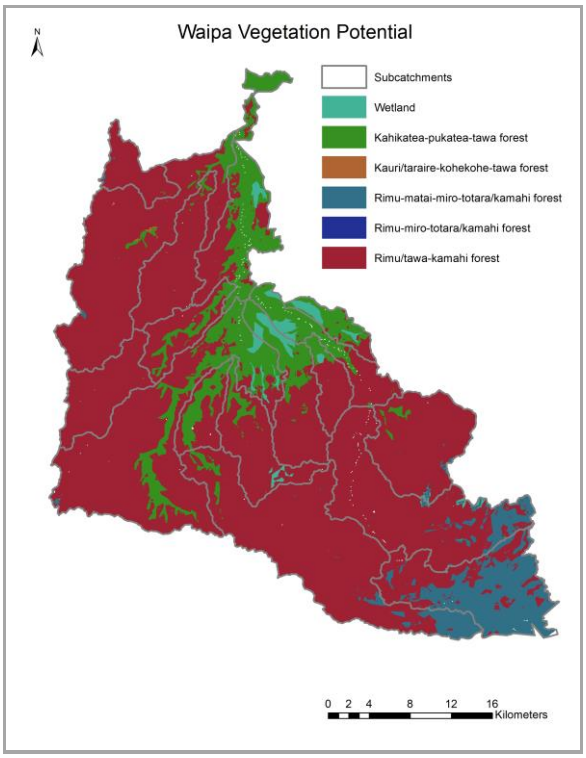
[24] http://www.teara.govt.nz/en/wetlands/page-1

pastoral land use[25]. Comparatively, the headwaters of the Waipā tributaries where farming is less intensive are much higher in biodiversity and overall water quality than the lower areas, and therefore provide a useful benchmark to set environmental standards.

Upper Waipā catchment: the study area

The target area for this feasibility study is the upper Waipā catchment, which covers an area of approximately 130,000 ha of primarily pastoral land. The predominant land use is sheep and beef and dairy which cover close to 60% of the target area (approximately 80,000 ha), followed by natural area/reserves which is about 25% of the catchment (30,000 ha). A detailed breakdown of land use in Waipā catchment is provided in Appendix 3.





Key environmental stresses for the upper Waipā include:

Erosion and sedimentation

[25] *Waikato River Independent Scoping Study.* NIWA 2011

The upper Waipā catchment is a significant contributor to the sediment load of Waikato River (see Table 7). 7,841 hectares have been classified as having severe erosion risk potential in the Upper Waipā, with only 10% of that land receiving any conservation management[26]. Chronic accelerated erosion in the area is fundamentally a result of two factors, i) the removal of vegetation which naturally binds the soil together, and ii) the breakdown of river banks by free-roaming livestock. Sedimentation has negative impacts on water quality and biodiversity, while also contributing to the aggradation of the river channels, transporting productive soils away from pasture and increasing the flood risk of the water body.

Declining water quality

Poor water quality in the upper Waipā is characterised primarily by elevated nutrient levels, sediment load, and faecal contamination (E. coli) (see Table 7 for details). High nutrient loads fuel algal growth which leads to the reduction of dissolved oxygen levels, negatively affecting aquatic life. Faecal contamination has a range of anthropogenic impacts as well as environmental, aside from unsafe drinking conditions and reduced recreational capacity, it may also cause death of sensitive native fish species.

Reduced biodiversity

The loss of biodiversity can be categorised by three main factors, i) the removal of key habitats (i.e. indigenous forests, wetlands, peat soils), ii) the alteration of the hydrology and nutrient composition of aquatic environments, and iii) the presence of introduced pest species. Integrated management of dairy farms, nutrient run-off, population connectivity and introduced predators is required.

Table 7. Waikato River total environmental loads per annum.

Catchment	Area (ha)	N leach (kg)	P Loss (kg)	Sediment (tonnes)	*E Coli* (peta)
Waikato River total	1,095,065	11,800,136	857,488	981,948	1,653
Waipā catchment total	309,332	4,143,495	287,077	394,073	438
% Waikato total	28%	35%	33%	40%	27%
Upper Waipā study area total	130,351	1,685,561	163,937	228,568	151
% Waipā catchment total	42%	41%	57%	58%	34%

Source: MOTU 2017

[26] Waipā Catchment Plan 2014.

Impact Investment in the Upper Waipā Catchment: concept and opportunities

The purpose of this project is to investigate new approaches for sustainable land management that could facilitate investment in land use and/or land cover change to achieve multiple benefits across priority ecosystem services in the target area. The priority ecosystem services in the upper Waipā catchment were determined at the start of project implementation using the Ecosystem Services Review (ESR) methodology[27].

The table below summaries the results for upper Waipā, which reflects the importance of maintaining specific provisioning services while environmental outputs/impacts have to be reduced.

Table 8. Priority ecosystem services for Waipā (identified using the Ecosystem Services Review methodology).

Provisioning	Regulating	Cultural
Crops	Global climate regulation	Recreation & ecotourism
Livestock	Regional/local climate regulation	Ethical & spiritual values
Wild foods	Water regulation (water timing & volume of flows)	
Timber & wood	Erosion control	
Freshwater	Water purification & waste treatment	
	Natural hazard mitigation	
Supporting		
Habitat		

The priority ecosystem services were then used to develop a project / investment matrix to serve as guidance for assessing investment opportunities and for measuring post-investment impacts too (see Appendix 4). In designing and applying the matrix, a number of principles have been considered:

- Replicability

[27] For more on the ESR methodology, see http://www.wri.org/publication/corporate-ecosystem-services-review

- New or enhanced revenue streams are sought (manuka honey, organics including both dairy and meat, carbon credits and bio-banking, water rights)
- Return on investment
- Environmental outcomes
- Social benefits (employment and skills, iwi aspirations)

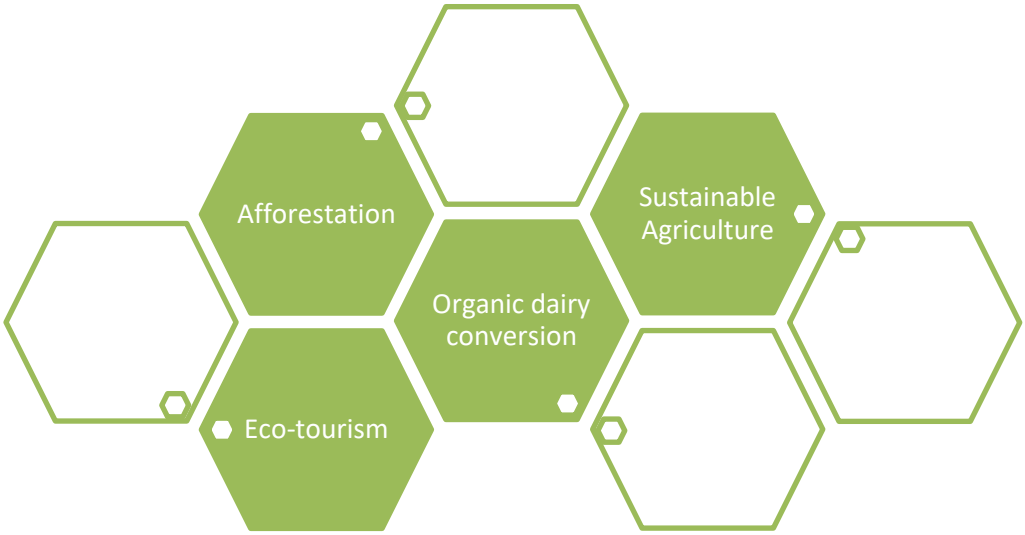
The matrix in Appendix 3 contains metrics that can be used to measure the impact of investments as they are identified. Three of these metrics (sediment, *E.coli* and nitrogen) are the core criteria whose levels have been estimated in terms of current baseline and impact post mitigation (i.e. investment). These criteria are reflected in the various mitigation measures that have been explored, and collectively they are aligned and address the ecosystem services approach taken in this study.

Potential investment opportunities

Potential investment needs have been identified that are related to one or more of the following: land cover / use (matching capability to use), land productivity (including value add) and carbon storage / credits. Prior to identifying any opportunities, an important step has been discussions with the Technical Advisory Group for the study and review of initiatives in the Waikato aimed at environmental restoration (specifically the Healthy River Plan Change and the Waikato and Waipā River Restoration Strategy). Once this high level and strategic environmental screening is considered, the next step was to apply investment lenses – namely, what interventions would generate revenue and cash flows that would make the investment attractive. As a highly modified agricultural catchment with a significant environmental footprint (see Table 7), an overall shift towards sustainable and low input agriculture was deemed important, in addition to afforestation and eco-tourism. However, from an investment perspective, afforestation and organic dairy conversion were selected as case studies for further analysis.

Other options (such as eco-tourism) may be considered into the future as part of an investment sequence master plan for the area.

Figure 2. Potential investment areas.



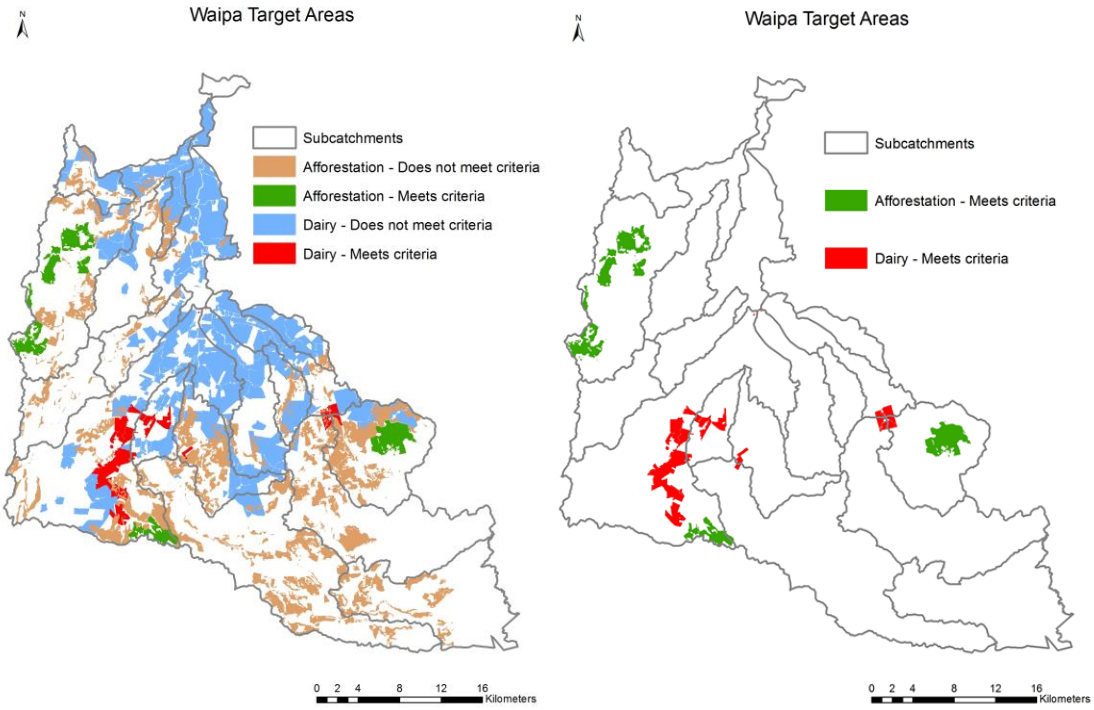
The two selected case studies, afforestation and organic dairy conversion, are analysed in detail below. When combining dairy and forestry, the total area targeted for investment that meets the environmental criteria of 40% annual aggregate loads[28] for sediment, *E.coli* and N is a total of 6,539 ha.

An estimate based on land price of $40,000/ha for dairy, and $15,000/ha for sheep & beef[29], suggests a potential total investment of around $175 million[30] under a land purchase model. The costs of environmental mitigation measures are considered under operating profit and IRR.

[28] The percentiles are based on total annual aggregate loads for the entire area of dairy farms in target sub-catchments.

[29] See for example https://www.interest.co.nz/rural/resources/farm-sales. However, there is uncertainty regarding the potential impact on land prices of Healthy River Plan Change.

[30] This investment estimate only refers to the cost of land and does not include costs such as cost of capital.



1. Afforestation

With the price of carbon increasing, and given the significant areas of land unsuitable for pastoral farming in Waipā, and high erosion levels, forestry appears to be a viable option. We have used the outputs of the *Waipā Afforestation Feasibility Study* that determined the areas suitable for afforestation to carry out an environmental output analysis for three criteria (sediment, E.coli and N) targeting LUC 6-8 under sheep & beef land use (which represented the largest land use proposed for afforestation by the *Waipā Afforestation Feasibility Study*).

Four afforestation scenarios were considered in the *Waipā Afforestation Feasibility Study.*

Table 9. Afforestation scenarios.

Key Assumptions	Current	Option 1	Option 2	Option 3	Option 4

Pine timber prices[31]	P40 180 P35 150 S30 110 S20 100 A 109 K 95 KI 88 Pulp 55	Increase 2% p.a. next 5 years	Same as current	Same as current	Same as current
Redwood timber price	P40 360 P35 185 S30 155 S20 125	Same as current	Increase 5%	Same as current	Same as current
Honey yield (kg/ha)	Reversion: 30 (1 hive@30Kg) Intensive: 80 (2 hives@40Kg)	Same as current	Same as current	Same as current	Same as current
Honey price (NZD/Kg)	30 (Reversion) 50 (Intensive)	Same as current	Same as current	40 (Reversion) 60 (Intensive)	Same as current
Carbon price (NZD/tCO_2)	18 (flat)	Same as current	Same as current	Same as current	1 yr: 18 1-5 yr: +5% p.a 6-14 yr: +3% p.a 15-25 yr: -5% p.a

It should be noted that sensitivity analysis for higher carbon price is expected to be carried out; however, the timing did not suit that of the impact investment study and it is not considered in this analysis.

A total of 22,739 ha has been identified as suitable for afforestation in the study area.

Table 10. Breakdown by land use and LUC of the area suitable for afforestation (study area only).

Land Use	LUC 6	LUC 7	LUC 8	Total Area (ha)
Dairy	2,477	326	25	2,828
Sheep & Beef	13,043	3,137	93	16,274
Woody Vegetation	2,292	966	105	3,363
Urban	186	22	5	213

[31] To understand this parameter: the first value ie P40 represents the log grade and 2nd value (ie 180) is the $/tonne. This applies to the next raw re. redwood timpber price.

Other	48	3	9	61
Total	**18,046**	**4,455**	**238**	**22,739**

The parameters for the analysis are as follows:

- Focused on top 40% load for specified criteria (sediment, E.coli, N) – a total of 3,484 ha. The percentiles are based on total annual aggregate loads for the entire area of sheep and beef farms in target sub-catchments.

Table 11. Area (ha) proposed for afforestation meeting specific environmental output criteria

Criteria	Top 20%	Top 40%	Top 60%	Top 80%	Top 100%
All three criteria	863	3,484	9,597	15,411	22,739
Erosion only	2,050	5,456	11,068	16,382	22,739
Nitrogen only	5,228	9,002	13,730	18,253	22,739
E.coli only	2,619	5,619	11,198	17,168	22,739

- Mean farm size of 250 hectares.
- Representative S&B Farm Profit Before Tax: $238/ha/year (based on 2011-16 average of Beef + Lamb Economic Survey of N.I. Hill Country).[32]

The results for the environmental-economic analysis for the 3,484 ha target area are:

- Afforesting 3,484 ha (15% of the eligible area) leads to 12-22% reduction in N, E.coli, and sediment generated from all 16,274 ha of sheep&beef potentially suitable for afforestation.

Table 12. Environmental mitigation outcomes for afforestation scenarios: all S&B farms vs target farms

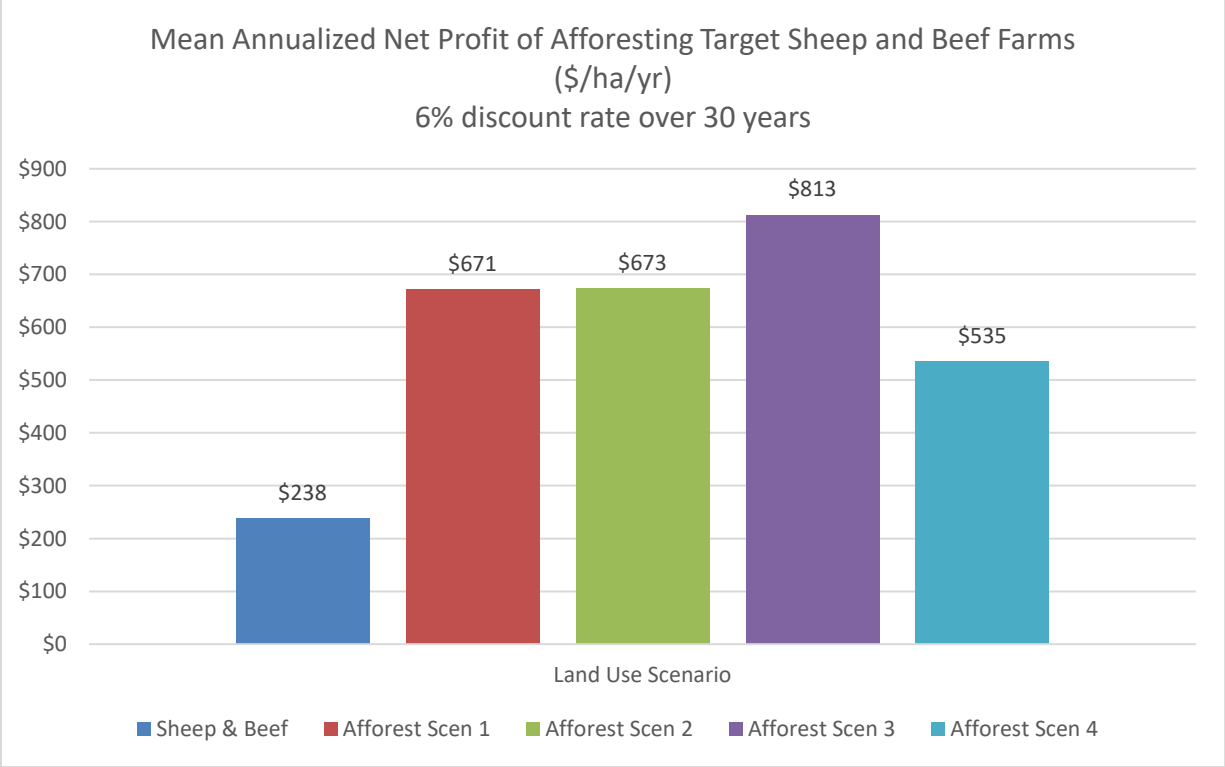
	Total N (kg)	Total Ecoli (peta)	Total Sed (t)	Total P (kg)	Net GHG (tCO2-e)
All Area Eligible for Afforestation (22,739 ha)					
Baseline	226,903	18.6	61,427	45,497	56,847
Afforestation Scenarios	200,059	15.7	48,013	37,640	39,425
% Change from base	-12%	-16%	-22%	-17%	-31%

[32] Report accessed from http://www.beeflambnz.com/information/on-farm-data-and-industry-production/sheep-beef-farm-survey/nni/.

All Sheep and Beef Farms Eligible for Afforestation (16,274 ha)					
Baseline	163,608	13.5	45,008	32,689	40,679
Afforest Scenarios	136,764	10.6	31,593	24,833	23,258
% Change from base	-16%	-21%	-30%	-24%	-43%
Only Targeted Farms Eligible for Afforestation (3,484 ha)					
Baseline	38,350	3.3	15,782	9,243	8,711
Afforestation Scenarios	11,505	0.4	2,367	1,386	-8,711
% Change from base	-70%	-88%	-85%	-85%	-200%

- Irrespective of the afforestation regime, there are significantly higher financial returns compared to current land-use (sheep & beef).

Figure 3. Mean annualised net profit of afforesting target sheep&beef farms ($/ha/yr)



2. Organic dairy conversion

The 2016 New Zealand Organic Market Report estimates that the market for organic food, exported and consumed domestically, was around $457m - $467m. This represents a 30% increase compared to 2012

and while demand is strong and organic milk price is higher than conventional (payout by Fonterra for past season was NZ$9.20/kg MS), the total land area under organic certification in NZ in 2015 was only 74,134 ha, a 30.5% decline from 2012. Whereas there are inherent risks to conversion to organics such as price volatility, there is still a strong business case to pursue conversion as a stepped approach to sustainable agriculture and farming within environmental limits.

In identifying dairy areas for organic conversions in the upper Waipā, we applied a stepped process of environmental-economic analysis to target areas with the highest environmental load for specified criteria (sediment, *E.coli* and nitrogen). The parameters for the analysis are:

- Focused on top 40% load for specified criteria (sediment, *E.coli*, N). The percentiles are based on total annual aggregate loads for the entire area of dairy farms in target sub-catchments.
- LUC categories 2-7 were considered for conversion to organic (note: less than 500 ha of dairying is currently undertaken on LUC 5 or 7 land; about 30% of the total dairy land is in LUC 6).
- Assumed a conversion period of 3 years.

Table 13. Key input metrics used in the organic dairy analysis

Metric	Unit	Value
Conventional Milk Price	$/kgMS	$6.00
Organic Milk Price	$/kgMS	$7.00
GHG Price (carbon)	$/tCO2-e	$18.00[33]
Farm Size	hectare	115
Stream Length	m/ha	15
Organic Certification Cost (per year for 3 years)	$	$15,000
Discount Rate	%	6%

Table 14. Dairy land area (ha) meeting specific environmental output criteria

Criteria	Top 20%	Top 40%	Top 60%	Top 80%	Top 100%
All 3 Criteria (ha)	2,085	3,055	6,363	13,902	32,830

[33] For this study, we assumed that riparian is eligible for forest carbon sequestration payments. Because of relatively small area of new planting, the impact on operating profit is approximately $10-20/ha/yr, depending on average stream length through a farm.

Erosion focused (ha)	3,376	8,680	13,682	21,775	32,830
N focused (ha)	5,974	12,664	18,928	25,626	32,830
Ecoli focused (ha)	3,519	5,845	10,970	17,891	32,830

Annualised costs for selected mitigation measures (note that costs can be additive) across mitigation practices are listed in Table 15 below.

Table 15. Annualised costs of mitigation measures (r = 6%, t = 30 years)

Mitigation Option[34]	**Farm Total ($/yr)***	**Per Ha ($/yr)**
Organic w/out new mitigation	$19,595	$139
Mid-catchment Wetland	$2,651	$20
Retention bund/sediment	$6,639	$54
Small Wetland/Sediment Pond	$10,147	$85
Soil Conservation Plan	$2,847	$21
5m Riparian Buffers	$2,547	$51
10m Riparian Buffers	$3,104	$76

The results for the environmental-economic analysis for the 3,055 ha target dairy area are:

- Organic payout of $7/kgMS leads to a 6.2-11.3% annual operating loss relative to 'conventional' dairy, depending on the mitigation measures implemented

Table 16. Organic dairy operating profit impacts: $7/kgMS

Dairy Farm Option ($7/kgMS)	**Annual operating profit (r=6%, t=30 yrs)**		
	Total	Per ha	% Difference
Conventional (baseline)	$6,467,097	$2,117	n/a
Organic w/no Add'l Mitigation	$6,064,380	$1,985	-6.2%
Organic + Wetland	$6,004,403	$1,965	-7.2%
Organic + Retention bund/sediment	$5,901,962	$1,932	-8.7%
Organic + Small Wetland/Sediment Pond	$5,804,576	$1,900	-10.2%

[34] The mitigation costs are drawn from a wide range of studies that have been referenced in the detailed economic analysis provided separately.

Organic + Soil Conservation Plan	$6,009,227	$1,967	-7.1%
Organic + 5m Riparian Buffers	$5,849,138	$1,915	-9.6%
Organic + 10m Riparian Buffers	$5,739,002	$1,879	-11.3%

However, when compared to the Fonterra payout of $9.20/kgMS for 2016/17 season, this can lead to a 55-64% increase in profit. The break-even milk payout is $7.35/kgMS.

Table 17. Organic dairy operating profit impacts: $9.2/kgMS

Dairy farm option ($9.20/kgMS)	Annual Op Profit (8%, 30 yrs)		
	Total	Per ha	% Change
Conventional (baseline)	$6,467,097	$2,117	n/a
Organic w/no Add'l Mitigation	$10,584,194	$3,464	64%
Organic + Wetland	$10,519,002	$3,443	63%
Organic + Retention bund/sediment	$10,338,346	$3,384	60%
Organic + Small Wetland/Sediment Pond	$10,157,532	$3,325	57%
Organic + Soil Conservation Plan	$10,529,041	$3,446	63%
Organic + 5m Riparian Buffers	$10,263,002	$3,359	59%
Organic + 10m Riparian Buffers	$10,046,918	$3,289	55%

Conversion to organics of the 3,055 ha will lead to 18-51% reduction in N and P, 18-67% for *E.coli*, and 18-58% for sediment.

Table 18. Organic dairy environmental outputs mitigation (3,055 ha)

% change on farms with mitigation (3,055 ha)	N leaching (kg/yr)	*E.coli* (peta)	Sediment (t)	P loss (kg)	Net GHG Emissions (tCO2e)
Conventional Dairy	82,650	9	6,523	5,015	27,496
Percent change from baseline					
Organic w/no Add'l Mitigation*	-18%	-18%	-18%	-18%	-18%
Organic + Wetland	-18%	-63%	-60%	-55%	-18%
Organic + Retention bund/sediment	-18%	-43%	-51%	-30%	-18%
Organic + Small Wetland/Sediment Pond	-18%	-63%	-60%	-55%	-18%

Organic + Soil Conservation Plan	-18%	-18%	-63%	-34%	-23%
Organic + 5m Riparian Buffers	-51%	-67%	-58%	-51%	-21%
Organic + 10m Riparian Buffers	-51%	-67%	-58%	-51%	-24%

When compared to the entire dairy area output, the total reduction is 6-7% reduction in dairy-based sediment and *E.coli* for most mitigation options considered, and 2-4% reduction in N, P, and GHG emissions (dependent on mitigation).

Table 19. Organic dairy environmental outputs mitigation (entire dairy in study area, 32,380 ha)

% change in relation to all dairy area (32,830 ha)	N leaching (kg/yr)	*E.coli* (peta)	Sediment (t)	P loss (kg)	Net GHG Emissions (tCO2e)
Conventional Dairy	867,250	79.3	46,174	49,561	295,474
Percent Change From Baseline					
Organic w/no Add'l Mitigation*	-1.7%	-2.1%	-2.5%	-1.8%	-1.7%
Organic + Wetland	-1.7%	-7.3%	-7.2%	-5.6%	-1.7%
Organic + Retention bund/sediment	-1.7%	-4.9%	-5.7%	-3.1%	-1.7%
Organic + Small Wetland/Sediment Pond	-1.7%	-7.3%	-7.2%	-5.6%	-1.7%
Organic + Soil Conservation Plan	-1.7%	-2.1%	-7.7%	-3.5%	-2.1%
Organic + 5m Riparian Buffers	-4.8%	-7.8%	-6.9%	-5.1%	-2.0%
Organic + 10m Riparian Buffers	-4.8%	-7.8%	-6.9%	-5.1%	-2.2%

3. Other options to consider

Whereas two of the investment opportunities have been analysed in detail above, there are other options that should be investigated as part of a longer-term investment roll out for the Upper Waipā. These potential investments have not been analysed at this point in time due to limited data but also less clarity vis a vis an investment pathway.

Eco-tourism (recreation and biking)

This would likely be done outside of any integrated / spatial impact investment modelling exercise, unless we wish to link tourism activities with land cover (e.g., multi-use such as mountain biking in redwood forest). Although there is significant synergy between afforestation, organic dairy, and eco-tourism, such a proposition would require much wider branding and building the story of the Waipā – beyond the current study area of this feasibility study. Synergies with other tourism opportunities in the area (e.g. Waitomo Caves, Avantidrome) and flagship sport events will need to be sought.

Sustainable agriculture

This presents opportunities similar to organic dairy but focuses more broadly on land use and / or horticulture, mixed pastoral, or possibly new crops. This requires more clarity re. specific economic and environmental objectives that we want to meet (i.e. what does sustainability mean, what are the social and economic issues that require solutions) but presents a great opportunity to identify new revenue streams (unlike organic dairy where increased revenue is primarily a result of organic certification). It is expected that this thinking will develop further as impact investing in the upper Waipā is progressed.

Delivery of Impact Investment

Role of government in impact investment

We assume local government will have an important role in impact investment regardless of whether it is a direct investor. Governments (central or regional/local) have already played a significant role in the mainstreaming of impact investing; primarily due to the fact that impact investments originally focused on social issues which are by and large the responsibility of the public sector[35].

In the conservation sector, public impact investment continues to outweigh private investments by an order of magnitude (see the section on conservation investments earlier in this report). Government can play a critical role in mainstreaming impact investment, ranging from direct investment to tax incentives, market creation, loan facilities and ensuring proper governance for new entities to channel

[35] Global Impact Investing Network (GIIN) (2016). *State of Private Investment in Conservation 2016: A Landscape Assessment of an Emerging Market.*

investments. The table below is written from a general government perspective and covers a wide range of roles the government can play; wherever possible commentary is provided relevant to the WRC context. The purpose of the list in Table 20 is to be as comprehensive as possible, recognising that it is not exhaustive and not all roles may be of interest or applicable to WRC. Lastly, it is envisaged that government plays a role before and after investment, though the degree of engagement can change.

Table 20. Potential role for government in impact investing

Role of (local) government and government finance		
	Pros	**Cons**
Policy and regulations that support environmental markets	Policy setting is a typical role for government (central or local). Significant policy measures are already implemented in relation to freshwater limits, catchment and land use management. E.g. Waikato Regional Council also has some expertise in cap and trade markets through Taupo Nutrient Cap and Trade, and early thinking around biodiversity offsets.	Requires in depth knowledge of non-financial markets and possibly valuation of environmental externalities. Can be dependent at times on direction from central government (for instance carbon pricing).
Investment catalyst	Typical role for government (at local or central level) is to act as a connector and bring parties together: supply (projects) and demand (investors). Includes tools government already uses: grants, guarantees, letters of credit, collateralisation, cost matching. Government can also play 'soft' roles such as advocacy for impact investing, education and support (for landowners, landcare groups etc), technical advice (land management, mitigation measures etc). NB: WRC already spends significant amount of resources (including $) for sustainable catchment management; such resources can be directed towards projects that attract impact investment.	Since there is limited experience with impact investing, government may need to act as catalyst across entire value chain: targeting projects, transparency of impact, coordination & engagement (investors, project developers, beneficiaries), implementation.
Buyer of credits or green products	This can be achieved by local government through responsible procurement and corporate social responsibility.	Requires political commitment to strategic objectives (carbon reductions, habitat creation etc).
Rates rebates/incentives (or subsidies)	Can target tax incentives at risky or early-stage investments in which public benefit is created, but below-market returns are at risk of being generated.	Can reduce revenue for government There needs to be clear agreement on (public) impact/benefit to justify rates relief/incentives (n.b. the level of relief is important too).
Provider of loan or funding facilities		Less common in conservation investment.

Issuer of debt	Existing experience in NZ in social impact investing (affordable housing).	Requires strong social return on investment analysis and articulation of public benefit to justify public debt.
Provider of guarantees	Government can provide a fiscal safety net for funds by providing guarantees as a means to underwrite financial performance.	The public benefit needs to be well articulated and significant to justify government guarantees.
Direct investor in a project/fund [36]	Public investment can make the project more attractive to private investment, especially when they agree to terms such as last one to exit etc.	For below the market return rates, government may have to accept lower rates than private partners.
Monitoring and measurement	Can be combined with existing state of the environment monitoring functions as well as enforcement.	There is still a lack of standardised frameworks for monitoring conservation impacts. Government may need to increase transparency of financial and non-financial reporting.
Information provision for decision making & accountability	Making use of existing data and capability that government (WRC) has e.g. land / water / GIS information Helps with project development and impact metrics, transparency regarding projects assessment and investment performance, including feasibility studies.	
Governance & operations	Experience setting up new entities aimed to deliver public benefits.	

[36] Subject to understanding the specific instrument(s) and costs/benefits.

The financial instruments covered in the table below are generally used in investment in the primary sector in New Zealand.

Table 21. Investment instruments in the NZ primary sector

	Debt	Equity	Government grant
Land-backed projects Conversions Organic Agriculture Organic Horticulture Apiculture Forestry	Bank funding available <80% loan to value (LVR) on land Typical farm / crop / forestry lending covenants	Iwi Government-linked land owners (e.g. Landcorp) Institutional fund managers (Superfund, ACC etc.) University endowment funds, High net worth investors ▪ Target similar IRR % metrics to traditional farm / crop / forestry returns ▪ Lower cash yield ▪ Capital gain	Lowest reliance on govt grant funding High likelihood of being economically viable utilising private funds Potential capex grants for one-off conversion costs Very low likelihood of opex grants
Asset-backed projects *(non-land)* Fishing quotas Aquaculture Agriculture Hortculture Api equipment	Bank funding available, linked to cash flow and asset backed metrics Banks will require a bank panel independent valuation on assets Typical bank metrics up to <70% LVR on assets Cash flow metrics taken into consideration: ▪ EBITDA/Interest ▪ Debt/EBITDA ▪ Net working capital metrics Could be part of an Operating Company / Property Company[37]	Widest variety of equity investors from SMEs to institutional depending on size of enterprise IRR % metrics more akin to private equity Higher cash yield Capital gain linked to earnings growth and EBITDA multiple maturation	Grant funding available but more reliant on commercial viability One-off capital or feasibility grants

[37] 'Operating Company/Property Company Deal - Opco/Propco Deal' is a type of business arrangement in which a subsidiary company (the property company) owns all the revenue-generating properties instead of the main company (operating company).

	Debt	Equity	Government grant
	structure with a land-backed asset		
Cash flow backed	Bank funding available, likely to be lower levels than asset-backed Cash flow metrics taken into consideration: ▪ EBITDA/Interest ▪ Debt/EBITDA up to 3-times ▪ Net working capital metrics Could be part of a Opco/Propco structure with a land-backed asset	Widest variety of equity investors from SMEs to institutional depending on size of enterprise IRR % metrics more akin to private equity Higher cash yield Capital gain linked to earnings growth and EBITDA multiple maturation	Grant funding available but more reliant on commercial viability One-off capital or feasibility grants

Source: personal communication, Bancorp.

Operating model considerations

There is no 'one size fits all' approach to governance or operation of impact investment structures and a key message from the investment sector is the need to keep operating models[38] as simple as possible, whilst meeting investor and regulatory requirements. The following discussion about operating models is somewhat premature as the ultimate determinant of how a future impact investment project and / or entity would be governed and structured will depend on the nature, scale, type of investment, and the specific expectations of investors. Discussions were held with investment and banking professionals (in NZ and US – see Appendix 6) regarding impact investing generally as well as operating and investment models; some investment models were considered in more detail (see below).

[38] The term 'operating model' is used in this context to include both governance and business operating elements.

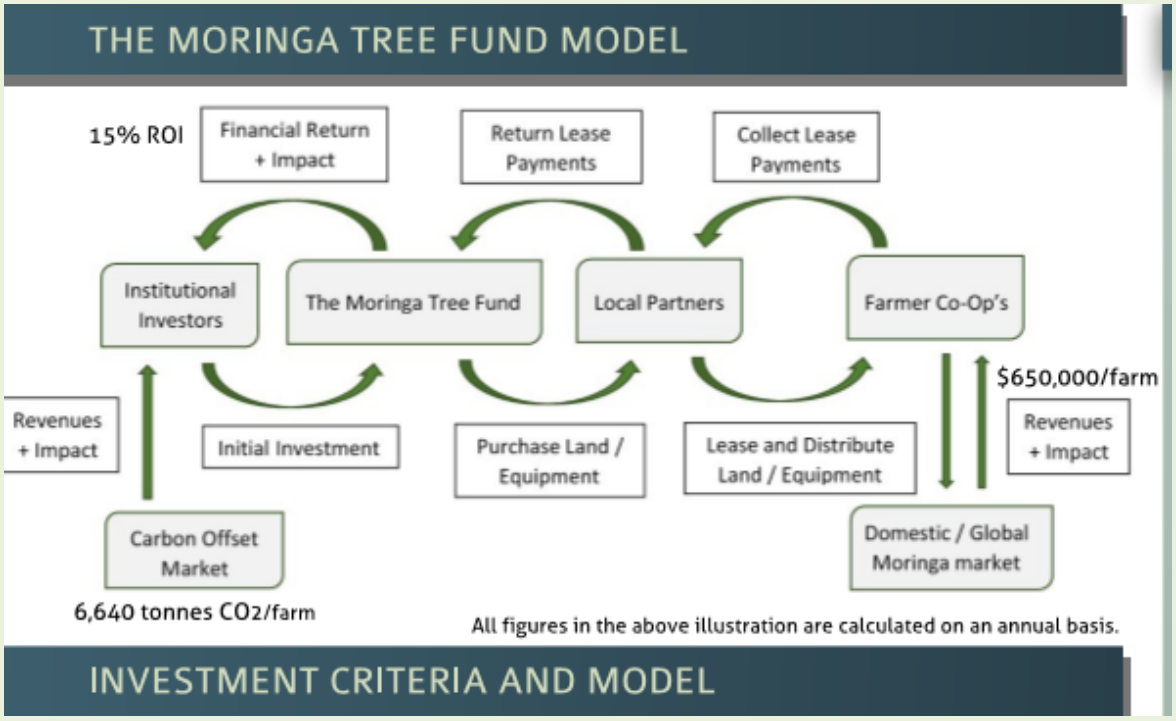
Table 21. Examples of selected investment models

Conservation finance

Examples of investment models

Moringa Fund

Moringa is an investment fund which targets agroforestry projects located in Latin America and Sub-Saharan Africa. Agroforestry is seen as a catalyst for creating shared value among an integrated value chain and a means to create socio-economic synergies and enhance livelihoods alongside with climate change mitigation and adaptation. The fund was set up in 2010 and has raised EUR 84 million; to date it invested in four projects and is looking for partners to develop sound and sustainable projects combining economic benefits with high environmental & social programs.



Eco-Business Fund

The Eco-Business Fund is a joint initiative of investors intent on supporting biodiversity conservation and the sustainable use of natural resources.

- The Eco-Business Fund is structured as a public-private partnership (PPP) and based on an innovative multiple tier capital structure, with participation of public investors, multilateral organizations, development finance institutions, NGOs, foundations and private institutional investors.

- Junior Shares provide the first loss-cushion for all other tranches, taking the first hit on any losses. Only if they are depleted will Senior Shares be exposed to further losses (if any), followed by subordinated notes and loans. The Senior Notes rank senior to all tranches.
- A series of limits ensures a minimum level of protection for each tranche.
- Returns are aligned with the level of risks taken on investment
- The fund also has a Development Facility, which provides final beneficiaries and local lending institutions with technical assistance as a way of mitigating risks in project development and delivery

It is of relevance to the wider context in NZ (not just Waipā – where scale is small) as a model for combining private capital with government assistance.

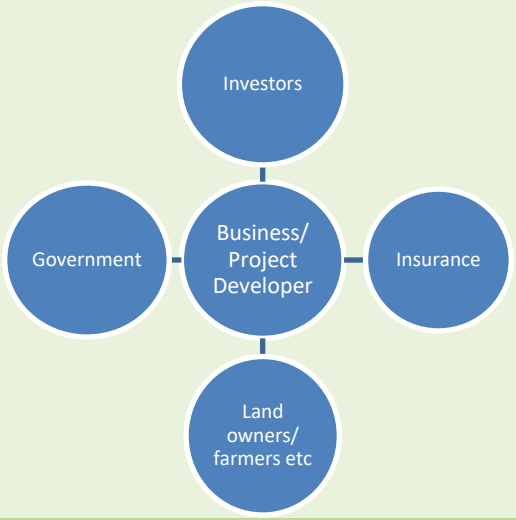
Iroquois Valley Farms - Privately raised debt for conversion to organics (USA)

Iroquois Valley Farms is a company that purchases and leases land to farming families. All farmland is transitioned to and maintained as USDA certified organic, which can lead to a premium crop price. In 2016, IVF raised funds through a USD 20 million capital raise of which USD 15 million is equity and USD 5 million is a series of notes. The company recognises the risks of over-leveraging, especially for a business focused on agriculture where returns are relatively modest; it also faces the challenge that investors tend to seek larger-sized investments. However, IVF as a company that manages a portfolio of agricultural assets proved that it can raise debt from investors to fund improvements to agricultural practices or equipment. Key elements include:

- Bonds or notes can be issued
- The security is based on the issuer's asset base, land or an existing loan portfolio
- The structure is primarily used to fund CAPEX and OPEX
- The borrower has a track record and a portfolio of assets

- Investment duration can be short or long
- The risks are primarily linked to the company (project developer).

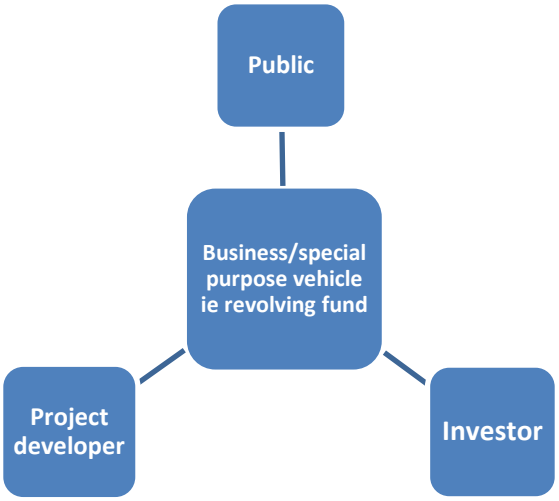
This model is relevant for Waipā as it focuses on conversion to organics – though it uses debt as investment mechanisms. Such model can be applied not just to a single type of project (organic dairy conversion) but heterogenous projects - for example combining dairy conversion with afforestation, agro-forestry, and eco-tourism.



Public Private Partnership model in the Murray Darling Basin, Australia

An example of a PPP has been developed by The Nature Conservancy in Australia. Key elements of the model include:

- Clear long-term public sector strategy where there is a cost saving or revenue increase that justifies spending public budget
- Requires sufficient portfolio of potential and sizeable projects to justify bond issuance
- Company or special purpose vehicle (SPV) has a strong independent track record of service delivery and arrangements in place for public sector and investors in case of non-delivery
- Agreed upon reporting criteria that have links to cost savings or revenue increases for the public sector



Options for investment models in Waipā

The proposed approach for targeted land use change in the Upper Waipā aimed at reducing specific environmental outputs through a portfolio investment approach involving two main areas of intervention: (1) the conversion of conventional dairy farming to certified organic dairy farming; (2) afforestation of beef and sheep land to produce revenue from timber, manuka honey and carbon credits, and selected environmental mitigation measures to supplement the above. The total area

targeted is approximately 6,539 ha; this represents areas with high environmental load for sediment, *E.coli* and nitrogen (see organic dairy opportunity analysis). This project could form a pilot that has the potential to be deployed over a significantly larger area both within the Waikato Region and beyond.

The four alternatives proposed below are based on the premise the return on capital invested for organic dairy conversion and afforestation is just over 5%, in line with average IRR in conservation investment but not overly attractive for private investment; yet they both deliver significant positive environmental outcomes. The analysis carried out in this report, however, does not include a cost of capital component and more detailed work would be required to better understand how the cost of capital may affect the overall findings of this report.

Determining the proper structure is a function of financial returns, capital requirements, environmental impact, and impact priorities. A decision needs to be made if capital providers are seeking ownership of assets (land), and / or will participate in the operating businesses (farming/timber/honey/carbon).

The expectation is that the potential investors in such an investment would be the likes of government social impact investment funds, the Waikato River Authority, investment funds (e.g. Superfund, ACC, Freshwater Environment Fund), foundations (e.g Next Foundation), and high-net-worth individuals with an equitised model applied. Waikato Regional Council and Waikato River Authority, as project sponsors, may also have preferences in terms of the type of investors to engage with. It is important to consider schemes that use public money and other incentives to leverage a free-market outcome that is fair to all parties and which can ensure the delivery of a positive environmental outcome.

Option 1 - Combined ownership / operating

An investor group can purchase all (or most of) the land, and take full responsibility for operating the properties. This strategy could ensure compliance with environmental outcomes[39], but places the investor group in a position of operational responsibility (ie farming and forestry) for which it may not have expertise, requires a significant amount of capital, and subjects the investor group to operational risks such as a significant fluctuation in the price of organic milk.

Option 2 - Land Ownership

[39] Some risks can be expected though in terms of how environmental outcome requirements can be imposed in private land transactions – and what role the government plays in that.

Alternatively, the investor group could purchase the land and lease it to operators (farmers). This model may entail a risk of non-compliance with environmental expectations (particularly for mitigation measures beyond organic certification), and therefore requires additional costs to monitor compliance, although these would be mandated through contracts. The strategy does optimise efficiency with capital providers being responsible for the capital-intensive aspect of the scheme (land purchase), and the operators with a competence in farming and other activities having responsibility for operations. This scheme would allow investors to avoid direct exposure to operational volatility (e.g. milk or honey prices), however, it would rely on payments from a lease group that has relatively low credit quality. In addition, in adverse conditions, the lease payments could be impaired.

Option 3 - Hybrid Structure

An optimal structure may be a hybrid structure wherein an investor group provides the capital to purchase land to be used for organic dairy conversion and afforestation projects. The land would be placed into a holding entity that can be structured as a property trust / fund (aka Waipā Water Fund) which will create tax efficiencies. The land would then be leased to operators (e.g. farmers/timber companies/carbon credit producers), and operating agreements established to mandate certain land management practices and minimum environmental outcome measures (such as organic dairy conversion and operation). Eventually, the land under a new use regime may be sold on to new owners.

The government (central or regional) would pledge credit support to the lease payments by guaranteeing a minimum payment amount; this will result in an off-balance sheet liability. In this scheme:

- the operators require considerably less capital which will dramatically enhance their returns on invested capital (albeit via a debt-like structure via lease agreements);
- WRC will create legal obligations to comply with environmental behaviour which will help ensure a positive environmental outcome;
- the public will not be directly subsidising private enterprise, but will provide a mechanism and framework to facilitate a free market solution; and
- a consortium of social impact investors, public investment funds, high net worth individuals and foundations will insert capital into the scheme and receive an economic return. Since a portion of that return will come from government back lease payments, the credit of that cash flow stream will result in a bond-like instrument and therefore be a very attractive financial investment instrument.

Option 4 – Land leasing

Land leasing is a common approach in the forestry sector, where there is significant experience with complex leasing arrangements depending on the needs of the lessee/lessor, built around JVs and so on. Leasing the land is also being used in dairy or manuka honey production, when greater control over feed and farming practices is pursued. A key benefit of leasing is a lower upfront capital commitment; however, in farming in particular the net profit when land is leased is quite low and the lessee will also forego the capital gain.

From an environmental outcome perspective, a key question is how to ensure that environmental outcomes are maintained for the long term, when the lease expires/is terminated. Establishing a lease agreement that facilitates conservation for the long term has to be considered from the outset. These advantages and disadvantages need to be considered as part of the business and financial analysis. A mix model of leased and purchased land (mixing afforestation with organic dairy) may be considered under this option.

Core functions of operating model – regardless of type of entity

There are two elements to impact investment regardless of size, location or sector; project scoping and development (which occurs prior to investment), and project delivery and investment management (after investment occurs). Each element has very different areas of focus.

1. Project scoping and development

Project Scoping (e.g. this report)

- Identify, scope and accurately describe possible investment opportunities (aka feasibility analysis).
- Undertake biophysical, social and financial analysis to determine costs and opportunities.

Project Development

- Stakeholder engagement.
- Take project development analysis and prepare investment memorandum (aka summary of business case) ready to take to potential investors. This includes initial summary (2-3 pages) outlining broad opportunity, and for those investors that indicate interest prepare full investment memorandum including identification of proposed investment model (types of investment vehicle – bonds, equity, debt etc).
- Lead engagement and negotiation with potential investors.

- Secure investment.

2. Project Delivery / Investment Management

Project Delivery

- Develop and deliver a project plan per the investment commitments.
- This may involve creation of new entities, acquisition of properties, formation of joint ventures, cooperatives etc. It will involve negotiations and delivery of commercial commitments with land owners, regulators, and commercial partners.

Investment Management

- Investor relations
- Regulatory compliance and reporting to investors / market
- Oversight / board relations
- In addition to the two core elements, a stand-alone entity will need back office functions (finance and accounting, IT, HR etc), some or all of which could be outsourced in early stages.

Assumptions

Some assumptions with regard to operating models that have emerged from interviews and literature include:

- Impact investment would not be limited to the upper Waipā Catchment, but it would be the first area (pilot stage). The preference to treat each as stand alone investment opportunity from a governance perspective but to group in the longer term from a delivery perspective.
- Some investors may want impact investing beyond Waikato and Waipā River catchment boundaries.
- Climate change will be an important element in investments over time.
- Investors could be public (councils, government), philanthropic and /or private (professional investors, large corporates). Entity structure and governance will be influenced by the capital attracted (philanthropy, commercial, mix of two).
- Assume a delivery entity would evolve over time as an impact investment portfolio grows from Waipā to other areas / investments.
- If Maori owned land is part of an impact investment, there may be ownership restrictions that influence the ultimate composition of an investment operating model (i.e. land can't be bought / sold as part of an investment).

Type of Entity

Interviews with investment professionals identified several key issues in determining what type and structure of entity to use. None of these are currently known, but all would be dealt with through the project development phase, including:

- Liability implications for participants and owners;
- Intended tax treatment;
- Land ownership (or not);
- Risks mitigation strategy and the need for collateral;
- Cost of formation and ongoing administration;
- Ownership and governance flexibility;
- Employee incentives; and
- Whether additional investors / contributors will be sought (as the investment portfolio grows).

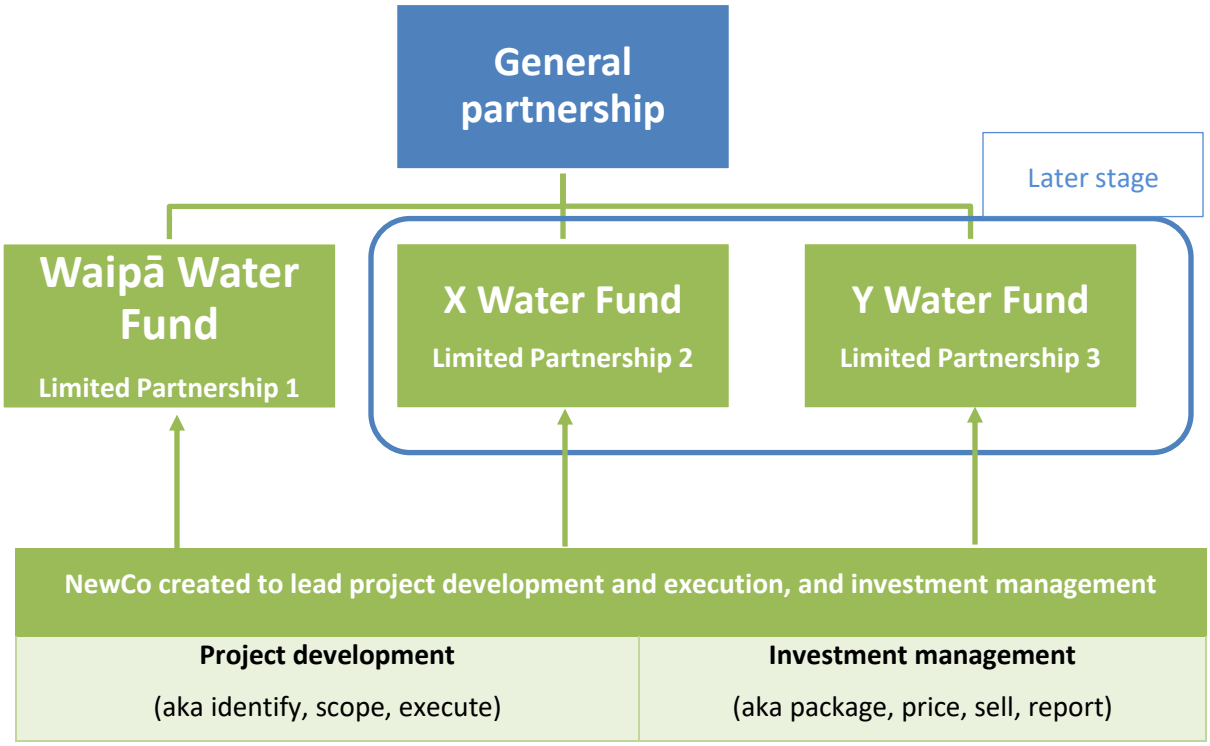
While it is premature to recommend a specific approach until more is known about an investable project, preferences or expectations of potential investors (public or private), it is our view that the Option 3 above represents one of the options that can fit investment considerations (especially in terms of attracting private capital) as well as delivering on environmental enhancements.

Recommendations

We have considered whether the operating model should start with a dedicated organisation with only a single pilot investment (Waipā) and conclude that there is considerable benefit in doing so, recognising the assumption that it will grow over time into multiple investments. This is reinforced by the interviews with investment professionals (listed in Appendix 6). Our recommendation is to create a stand-alone entity under a General Partnership / Limited Partnership structure with the Limited Partnership being the 'Waipā Water Fund' (see Figure 4).

The General Partnership provides governance, and project development and investment elements through the NewCo, which will initially focus on project development. The starting point could be to outsource investment attraction and management to an investment bank (or similar) until sufficient scale exists to bring that function in-house to the General Partnership. The assumption shown in the diagram below is that a separate advisory board would be created for Upper Waipā, and for each new Limited Partnership as new investments get added over time.

Figure 4: A depiction of a potential operating model



Key recommendations and next steps

This report has confirmed that impact investment in this context is feasible, with the results from economic modelling being broadly consistent with results from similar projects internationally, in the range of 5-7% IRR. It is therefore recommended that the feasibility study moves onto the next stage of early stage investment planning with the aim to develop the 'investable business case' and progress the relationship with relevant investors.

The project has not attempted to delve deeply into potential ancilliary sources of income / subsidies (e.g. rates relief, planting subsidies etc), and as a result we believe the results presented are conservative. The results also demonstrate that the potential environmental gains are significant, especially when compared with the status quo.

Clearly, there is a significant difference between modelling impact investment opportunities at a relatively small geographic scale, and having a clear and attractive proposition for investors, and also creating the platform for successful engagement and delivery of a project. The steps outlined below need to occur, although the precise order is difficult to determine, as some will influence others; so they will be somewhat cyclical in nature.

Next steps in this process are two-fold:

I Continue with the Upper Waipā as a pilot, and create an investable project, with the core elements of land owners and other stakeholders, investors, structure, and project development all advanced to the point of allowing significant investment in the Waipā Catchment to occur. This will involve enhanced coordination within WRC and WRA to ensure alignment of goals and vision, followed by an outreach strategy at regional and national level (land owners, farm organisations, MfE, MPI, trusts and foundations) to sow the seed of this initiative.

II Undertake further catchment-wide (or potentially region-wide) analysis to determine the potential scale and opportunities available to impact investment projects. A clear message from the investor community is that larger projects are preferable to smaller scale, so if it were possible to identify similar projects that could be executed alongside the Upper Waipā it may prove a more attractive investment proposition. Some of the financial mechanisms discussed in this report (e.g bonds) better align with larger scale projects, and the potential General

Partnership / Limited Partnership model would allow for sequential development of more than one area under a consistent governance and operating model and set of financial mechanisms.

The diagram below is a suggestion for a potential pathway to an investable project to be considered for the next phase of this study.

Pathway to an investable project

Project Development

Fully develop the project scope from theoretical to actual project plan

Include defensible (investable) financial analysis, including primary and ancilliary sources of income, subsidies etc

Ground truth in the catchment to move from theoretical to actual areas to be targeted

Include defensible environmental targets, and develop means by which to monitor effectiveness of investment and interventions

Investors

Once project development has been completed, test approach and structure with different investors via a short investment summary

Confirm short list of investors

Prepare full investment case

Present to potential investors

Secure investment

Structuring

Confirm preferred structure from investor perspective

Engage with global experts to determine how structures best work internationally and adapt for NZ context

Develop structure for inclusion in investor discussions

Legal structuring (post-investor commitment)

Engage Stakeholders

Sector groups

Potential commercial / delivery partners (e.g. Fonterra, forestry sector, Landcorp)

WRC and territorial authorities

Maniapoto Maori Trust Board commitment)

Government

Identify roles, including appetite for direct investment and non-direct assistance (e.g. rates relief, planting subsidies, policy settings)

Align with priorities (national, regional and local)

Resources and references

Credit Suisse, WWF, and McKinsey & Company (2014). Conservation Finance – Moving beyond donor funding toward an investor-driven approach.

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Cerasela Stancu and Nigel Bradly, Envirostrat.

Acknowledgements

The authors would like to thank several individuals for the support, expertise, data sharing and analysis provided during the project:

Steering Group Members: Vaughan Payne, Tracey May and Clare Crickett (WRC), Bob Penter (WRA) and Weo Maag (Maniapoto Māori Trust Board)

Technical Advisory Group members: Tariq Ashraf – project manager, Blair Keenan and Grant Blackie (WRC), Jo Kukutai (Maniapoto Māori Trust Board)

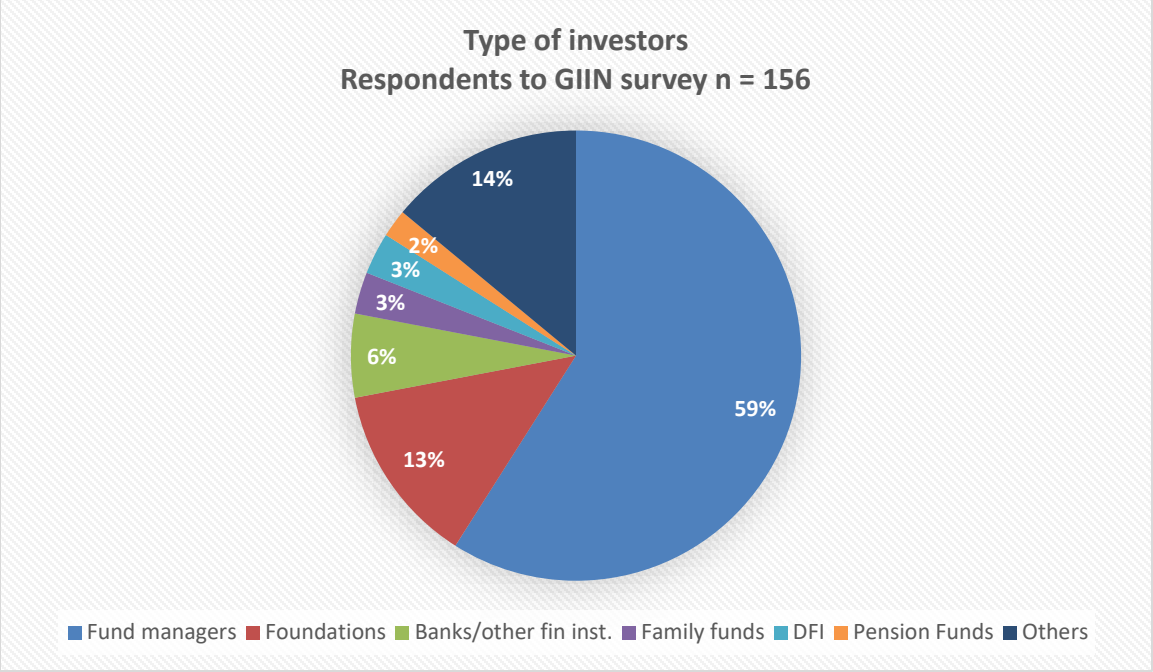
Katie Mayes, Waikato Regional Council

Matt Newman, Dairy NZ

Adam Daigneault, University of Maine.

Appendix 1: Impact investing facts and figures

The GIIN 2016 survey of impact investors shows not only a continuous growth of the sector but more importantly an increased level of market sophistication in terms of better quality investment opportunities and high levels of impact measurement and use of metrics (65% of respondents use metrics aligned with IRIS, the GIIN'S catalog of social and environmental metrics).

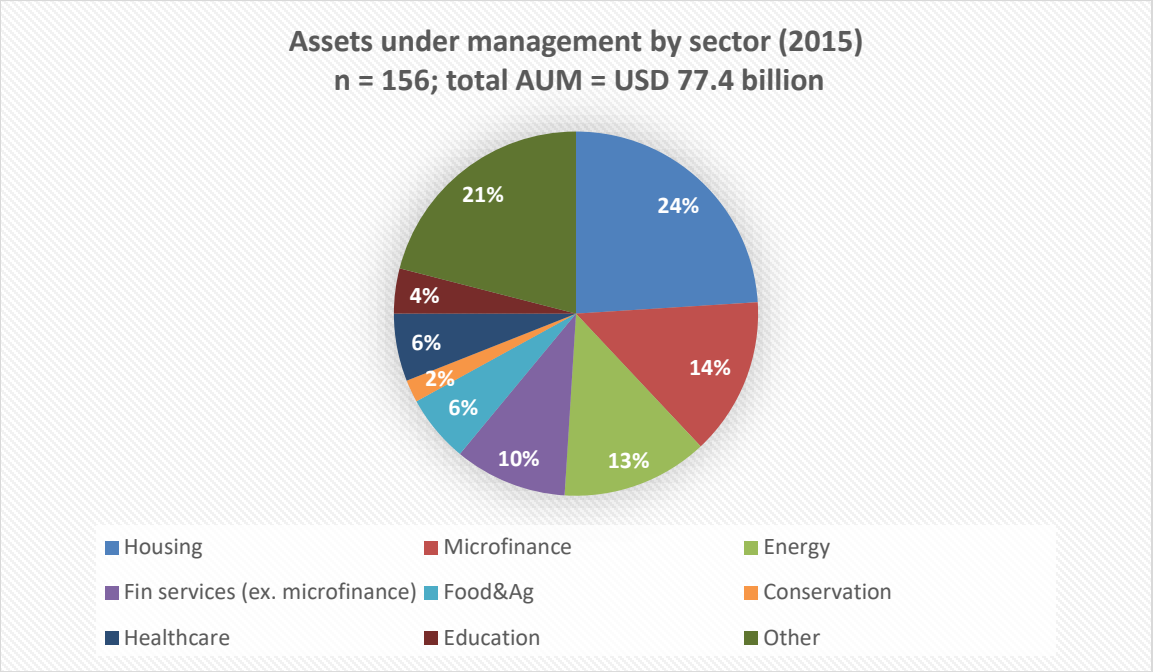


The GIIN report estimates that collectively, respondents to its survey have reported USD 116.2 billion in capital committed for impact investments since inception (pre-1995), at an average of USD 735 million and median of USD 87 million per year.

Organisation type	Capital committed (USD millions)	
	2015 Reported sum	2016 planned sum
Fund manager	7,192	9,463
Development Finance Institution (DFI)	5,012	4,937
Banks/diversified financial institutions	1,609	1,395
Foundations	260	291
Pension funds/ insurance companies	264	600
Family offices	204	202

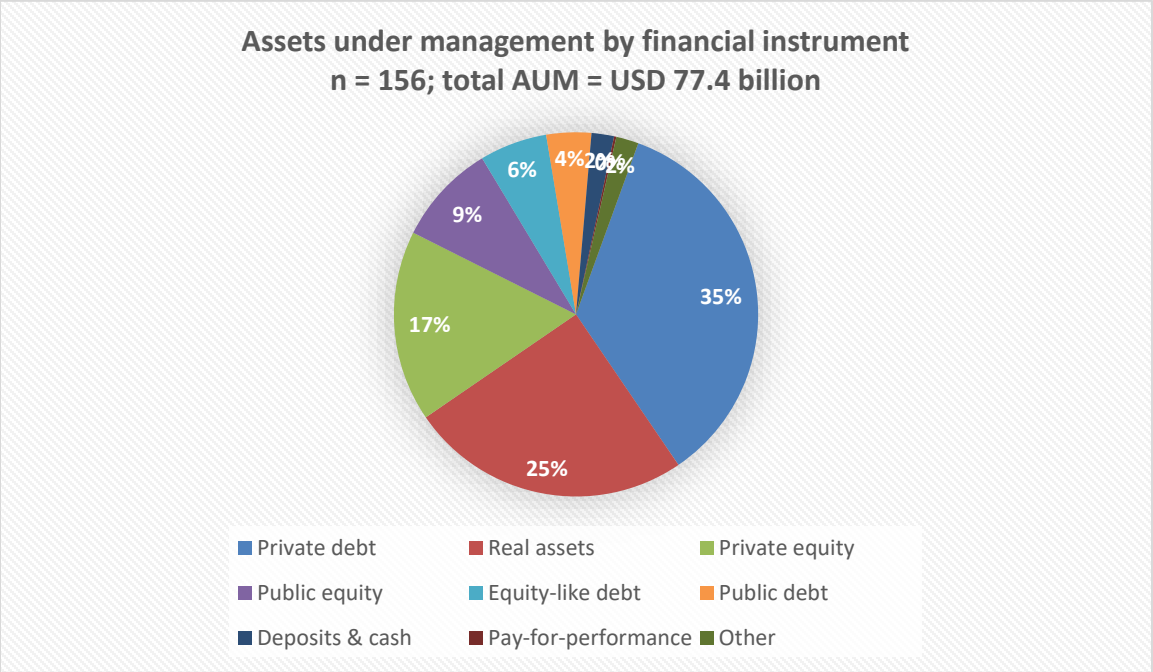
Other	690	836
TOTAL	15,231	17,723

In terms of total assets under management (AUM), the respondents to GIIN survey collectively manage USD 77.4 billion in impact investing assets. The food & agriculture and health sectors have the highest number of allocations, which suggests smaller amounts per allocation given that combined they only make up 12% of total AUM.



Private debt and private equity remain the key instruments used in impact investing, though allocation to private debt is much higher than that to private equity primarily due to the fact that larger investors allocate much more of their capital to private debt[40].

[40] Three of the 156 respondents to GIIN survey in 2016 make up for 36% AUM in the sample.

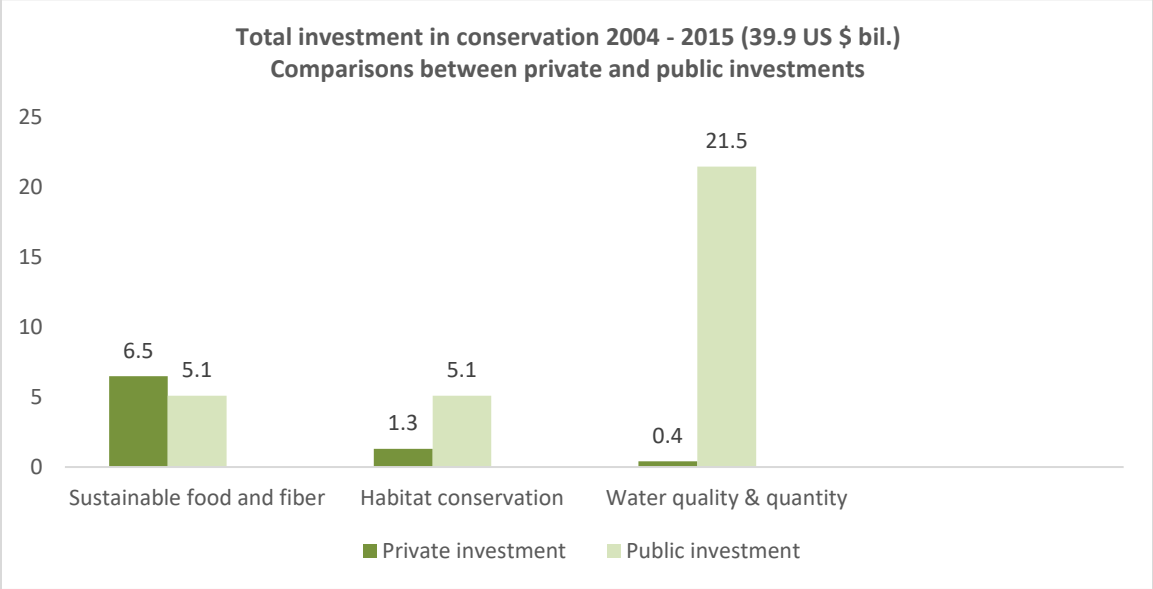


It is important in this context to note that there is a connection between the type of investor and the type of instrument used. For instance, pension funds prefer to invest in real assets (42.6%) and private equity (42.5%), while banks and DFIs prefer private debt (78.3% and respectively 93%). Public debt as an instrument is used the most by fund managers (10.4% allocation through it), but even then it is only their fourth choice after private debt, private equity, and real assets.

Regarding returns on investments made, roughly 60% of GIIN respondents have reported that they expect risk-adjusted market returns; 25% expect below but close to market rates and only about 15% have sought below market rate returns ie closer to capital preservation. This confirms once more the broad view that impact investing is about financial returns as much as non-financial returns.

Appendix 2: Conservation investment facts and figures

To date, private investment in conservation has been focused more on productive sectors (food and fiber) whereas public investments have predominantly focused on water quality and quantity.



The EMP study shows there is a trend in the number of organisations that commit capital of over $100 million, including several organisations that have committed $400 million or more since 2014. Organisations that make such large commitments appear to be able to do so by setting up new funds and attracting new and different types of investment. However, many of the investors surveyed reported commitments in the range of $10 to 100 million, a reflection of the fact that this investment market is still evolving.

The EMP report also shows that most investment was deployed through/by fund managers, followed by NGOs and corporations, with NGOs investing somewhat evenly across conservation categories.

Investor type	Capital committed by conservation category 2009-2015 as proportion from total (US$)		
	Sustainable food and fibre ($5.9B)	Habitat Conservation ($1.3B)	Water quality and quantity ($0.3B)
Fund managers	63%	56%	27%
Corporations	10%	16%	11%
NGOs	18%	15%	15%
Foundations	1%	10%	7%

Family offices/wealthy individuals	8%	-	32%
Other	-	4%	8%
TOTAL $M	5,900	1,300	300

Within each investment category, there are significant changes over the years driven by interest in specific conservation outcomes and/or mechanisms and assets used. For example, sustainable food and fibre is a fast-growing category, but within that aquaculture allocations have seen tremendous growth for the last two years only.

On the other hand, the majority of capital committed to habitat conservation (48%) went towards direct land ownership overall, yet this outcome area attracted the least amount of investment in 2015 – partly as a result of more interest in land easements in the U.S. market due to tax deductions. Yet, investment in real assets such as land are attractive overall since it is a way to mitigate risks (n.b. as long as the price holds up).

The EMP study does not draw specific conclusions on trends for water quality and quantity due to low number of respondents reporting investment in water and also because of the overlap with other areas of investment such as habitat banking or forestry which the private sector is currently more likely to target. Public investment, however, is very high in the water sector as discussed earlier in this report.

Investment category	**Top three ranked conservation investment outcomes 2004-2015**		
	1st	2nd	3rd
Sustainable food and fibre	Sustainable aquaculture	Sustainable forestry/timber	Sustainable agriculture
Habitat conservation	Direct land ownership	Mitigation banking	Land easements
Water quality and quantity	Other	Watershed protection	Water rights trading

Appendix 3: Land use in Waipā catchment

Land Use (ha)	LUC 2	LUC 3	LUC 4	LUC 5	LUC 6	LUC 7	LUC 8	LUC - town	Total Ha
Dairy	5,861	7,039	8,126	211	11,035	540	0	19	32,830
Sheep & Beef	1,274	5,585	11,413	2,847	39,600	9,065	1,144	578	71,505
Deer	1	49	305	246	556	42	0	0	1,198
Lifestyle	130	273	388	16	820	20	0	54	1,702
Arable	71	59	71	0	8	0	0	0	209
Horticulture	8	21	2	0	5	0	0	1	37
Forestry	5	289	1,195	72	3,520	633	59	3	5,775
Native Bush	1	87	913	59	8,221	5,227	1,236	0	15,744
Scrub	1	4	47	1	560	84	76	1	775
Urban	16	47	33	10	130	44	5	157	441
Other	3	14	52	0	36	4	22	2	133
Total	7,370	13,468	22,545	3,461	64,490	15,659	2,543	814	130,351

Source: Waikato Regional Council

Appendix 4: Project / investment matrix – selection and/or assessment criteria for multiple benefits

The environmental outcomes/benefits have been identified by applying a natural capital and ecosystem services prioritisation approach.

Other key considerations for project development include:

- Risk-return profile
- Ease of administration (depending on financial instruments used for financing)
- Addressing barrier to adoption of certain practices (low impact, organics etc) such as financial cost and decreased output when converting to organics.

Outcome/benefit	Metrics/KPI	Improvement/outcome target (project dependent)	Comments
Environmental outcomes (project and investment specific but informed by upper Waipā context)			
Cultivated crops	cultivated area by crop		Targets may be developed for new crops ie ginseng Crops in diff management regime ie organics (see habitat section)
	Yields by crop		
Livestock	Livestock stats (dairy, beef&sheep, etc) - output (milk, meat etc) -stocking rates		
Wildfoods	Outputs (stats)		Trout, pigs, deer, goat, watercress, game birds, rabbits Honey to be included here?
	Spatial distribution		
Timber & Wood	Forest area by forest type		Spatial modelling available
	Timber production stats (output, productivity, value)		
	Carbon stock (volume)		

	Carbon sequestration (volume		
Freshwater	Water availability and allocation by user groups		Targets to be informed by HRCP and Waikato Restoration Priorities, Waipā Catchment Plan (Sediment based on NZEEM or SedNet E. coli sourced from NIWA Nutrients based on Overseer and other data)
	Total soil water-holding capacity		
	Nutrient load (N leaching, P loss)		
	E.coli load		
	Rainfall (averages, spread)		
	Land-cover changes		
Global climate regulation	GHGs emissions by land use		Are stats by land use/land capability available? There is the issue of potential sequestration vs actual stocks
	Carbon offsets (volume and $ value)		
Regional/local climate regulation	Carbon sequestration (volume)		
Water regulation (water timing & volume of flows)**	Water storage capacity by land use		Occurrence of droughts/floods is also important to consider but not really a practical project KPI. Linked to global/regional climate KPI
	Soil water storage		
	Economic losses associated with floods/droughts		
Erosion control	Sediment load stats (by land use, spatial distribution)	Sedimentation reduction target from HRCP (spatial distribution) ≥ 40% sediment reduction	This is well covered in Healthy River PC and also WRS; data availability high.
	Stocking rates by land use		
	Land area with high erosion risk	Land use change achieved (ha, %)	

	Land use matching land capability (total ha and %)		
Water purification & waste treatment*	Nutrient loads (N, P) by land cover/use		How to link key contaminants with mitigation by ecosystems?
	Riparian area (ha)		
Natural hazard mitigation**	Area of wetlands located in flood risk zones		
	Water holding capacity of soils		
Habitat	Indigenous vegetation (% of Upper Waipā catchment covered in indigenous forest, scrub and tussock)		
	Significant natural areas/biodiversity values -total area (ha) or -share of SNAs from all farm land?		
	Riparian area restored/forest		
	Share of organic farming (by land use, product output, total)		
	Corridors created/connectivity		
	Biodiversity offsets		This is not a fungible product unlike carbon; but it is a tool in RMA and is seen as a potentially feasible option at regional level
Financial outcomes (project and investment specific)			
Return on investment	Average annualised ROI or IRR - Operational costs - Input costs - Commodity prices Return on invested capital	5 to 10% IRR	

New revenues	Outputs (volume and $) by product or revenue stream (carbon credits)		Milk solids, Timber, Honey, Dairy calves, Lambs, Mutton, Beef, Venison, Grains, Fruits, Vegetables It should account for revenue from credits like carbon etc
Government related aspects	Impact that investment could have on: - Taxation revenue - Rates revenue Subsidies or non-refundable grants		
Other	Total capital required	Millions	
	Length of investment	Years	
Cultural and social outcomes (project and investment specific)			
Recreation & ecotourism	Visitor statistics (by activity, venue, area) Swimming Mahinga kai		The cultural aspects require further development following understanding of maori aspirations – values – indicators
Ethical & spiritual values	Accessibility and protection of tapu sites		
Social and economic outcomes (regional Waikato outlook)			
GDP	$ invested		
Income	General: Difference in annual wages/salary for the jobs created versus the existing jobs at the business/land being invested in Maori: Difference in annual wages/salary for the jobs created versus the existing jobs at the business/land being invested in		
Employment	General: Creation of net new job opportunities (i.e. taking into account the existing jobs at the		

	business/land being invested in) Maori: Creation of net new job opportunities (i.e. taking into account the existing jobs)		
Youth (farm) employment	As per above		
Enterprise mix and productivity in Upper Waipā			

Appendix 5: Model assumptions and references

Key Model Metrics

Metric	Value	Notes
Discount Rate	6%	Consistent with *Waipā Afforestation Feasibility Study* assumption for afforestation assessment
Time length	30 years	Consistent with *Waipā Afforestation Feasibility Study* assumption for afforestation assessment
Carbon price	$18/tCO2-e	Current market price, and consistent with *Waipā Afforestation Feasibility Study* assumption for afforestation assessment
Organic MS price	$7/kg	Long-run average provided by DairyNZ. Current Fonterra payout is $9.20, used for sensitivity analysis
Conventional MS Price	$6/kg	Long-run average provided by DairyNZ.
Sheep and Beef Net Returns	$238/ha/yr	Long-run average of farm profit before tax for Class 3 and 4 Northern North Island hill country farms from B+L Farm Economic Survey
Afforestation Net Returns	Varies	Directly used estimates from INDUFOR afforestation assessment

Mitigation Assumptions

Mitigation Option	Source(s)	Notes
Organic w/no Additional Mitigation	DairyNZ	Used financial values provided by DairyNZ. Mitigation effectiveness same as percent reduction in stocking rate (3.1 v 2.5 cows/ha)
Mid-catchment Wetland	1, 2,4	Constructed or restored, includes planting and fencing 1 per 400 ha
Retention bund/sediment	1,4	Constructed, includes planting and fencing 1 per 20 ha
Small Wetland/ Sediment Pond	1,2,4	Constructed, includes planting and fencing 1 per 20 ha
Soil Conservation Plan	1,2,4,5,6	Primarily pole planting on high erodible land
5m Riparian Buffers	1,3,4	Requires fencing and planted vegetation
10m Riparian Buffers	1,3,4	Requires fencing and planted vegetation
Afforestation	1,2,4,6	Costs same as INDUFOR analysis

Source	Reference
1	Basher L. 2017. Kaipara Harbour Sediment Mitigation Study – Mitigation Cost and Effectiveness. Landcare Research Analysis, January 2017.
2	Daigneault A, Samarasinghe O. 2015. Whangarei Harbour sediment and E.coli study: Catchment economic modelling. MPI Technical Paper No. 2017/15.
3	Daigneault, A., F. Eppink, and W. Lee. 2017. A national riparian restoration programme in New Zealand: is it value for money? Journal of Environmental Management. 187:166-177.
4	Doole, G. 2015. Description of mitigation options defined within the economic model for Healthy Rivers Wai Ora Project: Description of options and sensitivity analysis. 74p
5	Dymond JR, Betts HD, Schierlitz CS. 2010. An erosion model for evaluating regional land-use scenarios. Environmental Modelling and Software 25: 289–298
6	Fernandez M., and A. Daigneault. 2017. Erosion Mitigation in the Waikato District, New Zealand: Economic Implications for Agriculture. Agricultural Economics 48(3): 341-361.

Appendix 6: Investment professionals interviewed

Paul Blair, Head of Institutional Banking, BNZ

Will Carnachan, Head of Specialised Finance, BNZ

Tony Hannon, GM, Bancorp

Andrew Christie, Senior Analyst, Bancorp

Charlotte Kaiser, Deputy Managing Director, Nature Vest

Daniel Shemie, Strategy Director Water Funds, The Nature Conservancy

Kelly Wachowicz, Partner, Catch Invest

Dr David Teece, Professor of Global Business Innovation, University of California Berkeley

Vishwanie Maharaj, Principal Economist, WWF

Milen Dyoulgerov, Principal Economist, World Bank Group