

Three case studies: companion document to the Evaluation of the Sustainable Farming Fund

Report

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NOTE: This document is a companion to the main *Evaluation of the Sustainable Farming Fund* (2014) and is available at www.mpi.govt.nz/agriculture/funding-programmes/sustainable-farming-fund

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1 Introduction

Report structure

1. This report is a companion document to the *Evaluation of the Sustainable Farming Fund* (Oakden, King, & Allen. 2014). These three case studies are primary data, developed to provide additional depth and breadth of outcome evidence to support the evaluation of the Sustainable Farming Fund (SFF).
2. In order to help determine the value of SFF outcomes, the case studies were developed as performance stories. Each story highlights how cumulative impacts from a number of related SFF projects develop over time, with later projects building on learnings from those conducted earlier. These were designed to provide sufficient depth to show the extent to which projects can build on each other, and the ways in which (for these clusters) SFF is worth the investment.¹
3. The evaluators drew on the expertise of Ministry for Primary Industries (MPI) staff with considerable experience of SFF to select the cases. These were selected to provide a good, representative sample of the breadth and variety of SFF projects. They were intended to capture the learnings from cumulative impacts that developed within, and across projects. They represent a range of projects – across different types of production, regions, SFF staff and the 12-year timeframe of the SFF portfolio, and types and sizes of SFF funding; and they include a project that benefited Māori.
4. The case study stories were developed between 20 May 2013 and 15 October 2013. Full details on the methodology used are outlined in Section Five.
5. The performance stories draw heavily on the details provided by grantees in their SFF project reports and other project literature. The framing and lessons that emerge were guided by related interviews with key project staff and stakeholders.
6. This report begins by providing an introduction and summary of findings for each of the three case studies. Each case is then described in detail. An overview sets the context, the performance story for each cluster of projects is provided, and then lessons to highlight the value generated from the investment are explored. A final section provides details of the methodology.

¹ To provide an explicit basis for evaluating value for money, an evaluative rubric was developed that specifies evaluative criteria at a range of levels of performance. For example, there is a set of criteria that articulate minimum expectations for the SFF ('minimally acceptable value for money') as well as criteria that would indicate the SFF was 'excellent value for money' and a range of levels in between. The rubric covers four key performance areas: Environmental dimensions, Social dimensions, Economic dimensions and Cultural dimensions. A fuller description of the rubric can be found in the main evaluation report that these case studies accompany.

Summary of findings

1. The three case studies show the collective benefits of a cluster of projects in delivering added value to rural communities. Previous evaluations have only viewed projects as individual entities, and have not considered their collective impact. Based on the evidence in these cases it is apparent that the collective value of a series of SFF projects is greater than the apparent value of individual projects when viewed in isolation. This is one of the key findings of the main SFF evaluation.
2. The three studies traverse a range of project foci. They look at the sustainability of the New Zealand wine industry, catchment water quality, and forest restoration on Māori lands.

Protecting the sustainability of New Zealand vineyards

3. The New Zealand wine industry is an important and growing contributor to the economy, with annual export returns of \$1.2 billion and a further \$500 million in domestic earnings. There is clear evidence that SFF grants have contributed to helping the viticulture industry position itself as a premium wine producer - protecting the productivity of the industry, and helping to facilitate ongoing market access and premium pricing.
4. Ten SFF projects over the past 12 years (2001 - current) helped the wine industry to establish premium market positioning through addressing a range of opportunities and challenges. New Zealand Winegrowers acted as the primary conduit for these SFF projects. The projects' foci included a disease challenge, managing vine yield, energy efficiency in winemaking, residue-free wine production and a sustainability accreditation programme. Later projects purposefully built on the work of earlier ones, enabling further development or up-scaling of activity.
5. A number of the early projects directly supported the development of certified environmental programmes for New Zealand vineyards, which have since collectively become known as Sustainable Winegrowing New Zealand (SWNZ). It is estimated that today more than 94% of the producing vineyard area participates in SWNZ, with a further 3-5% under certified organic programmes. More recent projects involve the wider industry in developing best management practices to support quality vineyard production.
6. These projects illustrate how the SFF can punch above its weight, with small strategic investments having significant impacts. The projects involved SFF grants of \$2.9 million and industry contributions of \$3.2 million over 12 years. On an annualised basis, this is equivalent to 0.03% of current industry earnings (or \$1 per \$3,300). Given the aims and success of the projects, more than breaking even on this investment seems plausible but cannot be substantiated with available data.

Top of the South: Setting an example for sustainable water quality

7. New Zealand needs to reduce contaminant losses from farms to waterways, and to begin to reverse the degradation of our waterways. Apart from the benefits for the environment, it is necessary from an economic standpoint to protect the international reputation of New Zealand's primary sector industries by ensuring they meet consumer demand in some parts of the world for responsibly produced goods – thereby protecting the ongoing market.
8. In practice, addressing water quality issues is complex, technical and takes extended periods of time to achieve. Three SFF projects in the Top of the South (between 2006 - 2012) provide award-winning examples of rural communities collaboratively addressing water quality issues in their local catchment. The projects, all located in the Top of the South Island, highlight how individuals and communities need to be engaged to become part of the solution and improve fresh water quality in a catchment.
9. These SFF projects resulted in their farming communities having working plans for ongoing activities that provide a pathway forward over the next few years. Farmers were encouraged as leaders of positive change. The projects also facilitated greater connectedness or social capital within the communities through partnerships between land managers and a wide range of other stakeholders including scientists, central and local government, and community and industry facilitators.
10. These projects in the Sherry, Rai and Aorere catchments each featured significant participation by dairy farmers, and the challenges and benefits facing this farm sector are highlighted through this performance story. Dairy farmers provide a window on the multi-level and complex challenges communities face as they manage water quality issues. Their stories also demonstrate the value of community-level approaches to catchment management, and the need to develop partnerships with Councils, neighbouring communities and industry.
11. Investment by the SFF and partners in the Aorere and Rai projects enabled farmers in these catchments to demonstrate high levels of compliance with good management practice. Water quality is not improved overnight, but as these cases illustrate, significant steps were taken to arrest its decline and generate improvements. These steps involve the full range of land uses in the region. To provide an economic perspective, this was achieved for a project investment across two projects of \$477,000 through the SFF and a further \$2.2m from industry partners² – less than 2% of projected 15-year dairy income for the Aorere and Rai catchments.

Sustainable development and podocarp restoration on Tuawhenua lands:

12. The Tūhoe Tuawhenua Trust administers a large tract of land around Ruatāhuna, which is central to the identity and wellbeing of the hapu of

² Including past (\$1.5m) and anticipated future investment (\$0.7m)

Ruatāhuna and Ngai Tūhoe. The Trust seeks a future for Tuawhenua lands where the people and the lands are in harmony and thriving. As part of this, it seeks to restore podocarp while creating economic opportunities for Ruatāhuna people.

13. Three SFF projects, one that was completed in 2010 and two that run from 2013-14, are helping the Trust to develop a holistic and natural approach to the utilisation and restoration of native forest blocks. The projects supported the local community to gain valuable understanding of forest dynamics, and experience and skills in planting and husbandry techniques, extraction and milling, and marketing. The SFF projects are underpinned by Māori principles to ensure the outcomes meet local people's aspirations. The projects also provided the opportunity for the Trust to build wider partnerships and networks that will support future management initiatives.
14. The Trust's long term vision for forest restoration recognises the 500-year plus timescale required for podocarp regeneration. Already, however, there is good progress on environmental improvements. A holistic and natural approach to the utilisation and restoration of Trust lands has been developed, and implementation has started.
15. It is too early to link these SFF projects with an economic return from indigenous sustainable forest management on Trust lands. Nevertheless, the research has identified a way forward that may, over time, show economic potential associated with developing the market for indigenous timbers. In the Tūhoe context such economic returns, if realised, could contribute to future local economic potential through increased self-sufficiency and reduced state assistance.
16. The development of the sustainable management approach illustrates the importance of taking the time to engage people and think through the elements needed to underpin sustainable and culturally appropriate land management. These efforts have left the community with a plan that suits their people and their lands. The plan highlights the efforts of Trust members as leaders of positive change within the wider community.

2 Case: Protecting the sustainability of New Zealand vineyards

Overview

Collectively these research projects illustrate how the building of strong industry-research partnerships can facilitate ... on-the-ground uptake. [Industry representative]

17. The New Zealand wine industry is an important and growing contributor to the economy, with annual export returns of \$1.2 billion and a further \$500 million in domestic earnings. Protecting the quality and productivity of this industry helps to facilitate ongoing market access and premium pricing.
18. The wine industry has established a premium market positioning by addressing a range of opportunities and challenges with contribution from ten SFF projects over the past 12 years (2001 – current). New Zealand Winegrowers acted as the primary conduit for these SFF projects. The projects' foci included a disease challenge, managing vine yield, energy efficiency in winemaking, residue-free wine production and a sustainability accreditation programme. Later projects purposefully built on the extension and engagement efforts of earlier projects, enabling further development or up-scaling of activity.
19. According to Industry Representatives and MPI Advisers a number of the early projects directly supported the development of certified environmental programmes for New Zealand vineyards, which have since collectively become known as Sustainable Winegrowing New Zealand (SWNZ). New Zealand Winegrowers estimate that today more than 94% of the producing vineyard area participate in SWNZ, with a further 3-5% operating under certified organic programmes. More recent projects involve the wider industry in developing best management practices to support quality vineyard production.
20. These projects illustrate how the SFF can punch above its weight, with small strategic investments having significant impacts. The projects involved SFF grants of \$2.9 million and industry contributions of \$3.2 million over 12 years. On an annualised basis, this is equivalent to 0.03% of current industry earnings (or \$1 per \$3,300). Given the aims and success of the projects, more than breaking even on this investment seems plausible but cannot be substantiated with available data.
21. One project, for example, provided a tool that wineries can use to assess and improve their energy efficiency. Undertaken with SFF grants of \$170,000 and industry contributions of \$100,000, this project helped

identify potential savings of \$700,000 per annum for the 130 wineries that participated in the most recent energy benchmarking survey.

22. Collectively, these 10 projects created strong linkages between research and industry, supported high levels of innovation and uptake, and supported the development of industry best practice.
23. The 10 projects included in this case study are outlined in the following table. This table provides details of the project title and timeframe, the SFF funding received, and the total project funding which includes the value of in-kind support.

Table 1: Summary of SFF projects included in the 'Protecting the sustainability of New Zealand vineyards' case study

Projects	SFF Funding	Total project funding
01/131: Implementation of systems to benchmark and improve the sustainability of NZ wine grape production practices under sustainable winegrowing NZ (2001-2003)	\$78,750	\$165,375
03/141: GIS mapping of the national vineyards for the wine industry (2004 – 2007)	\$18,725	\$45,775
03/143: Focus vineyards: what is the best practice and how to improve adoption of this best practice? (2004 – 2007)	\$600,525	\$831,150
L03/024: SWNZ workshop series to increase awareness of the implication of Resource Management legislation for the wine industry (2003)	\$10,000	\$33,000
06/096: Strategy for improving energy use in the wine industry (2006 – 2009)	\$171,250	\$270,969
07/123: Implementing ultra low residue wine grape production (GrapeSafe) (2007 – 2010)	\$248,000	\$938,132
09/144: Leafroll Virus control in New Zealand vineyards (2009 – 2012)	\$540,000	\$1,407,525
11/111 (In progress): Organic focus vineyard project (2011 – 2014)	\$139,769	\$374,810
11/110 (in progress): New opportunities for sustainable grape thinning (2011 – 2014)	\$530,000	\$1,190,492
12/073 (In progress): Sustainable virus-free vineyards replants and beyond (2012 – 2015)	\$578,565	\$897,188
Total	\$2,915,584.00	\$6,154,416

Context

24. New Zealand has established itself as a producer of premium wines, making a large variety of wine types enjoyed both locally and overseas. While the New Zealand wine industry is relatively new, it ranks as New Zealand's eighth highest export earner by value and is an important contributor to the New Zealand economy. Exports have grown from approximately \$200 million 10 years ago, to annual export returns of \$1.2

billion³ in 2012. The wine industry also generates domestic earnings of around \$500 million.⁴

25. Between 1994 and 2004 the area under grapes in New Zealand nearly tripled from around 6,500 to 18,000 hectares and reached more than 30,000 ha by 2009. More recently, the area under grapes has steadied at just under 34,000 ha.⁵
26. New Zealand Winegrowers, established in 2002, represents the country's 1,700 grape growers and winemakers and fulfils a major partnership role for research projects. The organisation funds research activities via levies on sales of grapes and wine.
27. The New Zealand Winegrowers research team also develops and runs a number of projects, some co-funded as part of larger government-funded research programmes. The New Zealand Winegrowers team plays a major role in disseminating the information, knowledge and results of this research back to the industry and were key informants for this case study.

Key stakeholder groups

28. The SFF projects involved, and networked with, a number of groups and activities:
 - NZ Winegrowers (as an industry-wide body representing the country's 1700 grape growers and wine makers)
 - Plant and Food Research Ltd (a New Zealand Crown Research Institute)
 - Grape growers
 - Wine makers
 - Independent contractors (providing services to grape growers).

Case study performance story

29. New Zealand Winegrowers has been involved with the SFF since its inception, during a time of rapid expansion of the industry. Industry representatives (Winegrowers New Zealand staff interviewed for this case study) and SFF project reports outline how early SFF projects aimed to provide benchmarking information about the industry, and also helped cement key research and extension relationships. The first of these 2003-initiated projects (SFF 03/141) developed databases of information on vineyard areas, locations and contacts. The second 2003-initiated project (SFF 03/143), a three-year initiative, investigated best-practice techniques in vineyards within the emerging wine industry and how to

³ Deloitte 2012

⁴ <http://www.nzwine.com/research/what-we-do/>

⁵ Vineyard area statistics from New Zealand Winegrowers Statistical Annual 2009

improve the adoption of this best practice with a focus on sustainable winegrowing. Research and technology transfer activities were undertaken on six “focus vineyard” properties in Marlborough and Hawke’s Bay, representing distinct grape growing environments and management systems in each region. These focus vineyards combined base data collection and applied research projects.

30. According to Industry representatives and MPI Advisers field days and seminars over the course of the project were well attended, highlighting growers’ interest in coming together and learning about best practice. Industry Representatives believe this work provided a model for the widespread use of focus vineyards to support best-practice refinement and extension.

Supporting sustainability

Early beginnings pre SFF

31. The industry’s early growth arose from significant increases in exports, particularly to the United Kingdom – which showed a developing interest in procuring goods with well-established environmental credentials. Industry representatives observed that industry leaders at the time believed that taking a proactive approach towards sustainable production would meet this growing demand and assist individual companies to enhance their marketing opportunities. Accordingly, in 1995 the industry launched a holistic vineyard programme, which in 2007 was launched as Sustainable Winegrowing New Zealand (SWNZ). SWNZ is now managed by New Zealand Winegrowers. A series of New Zealand Winegrower-led SFF projects provided direct research support for the industry’s commitment to sustainable production.

Developing guidelines for sustainable viticulture

32. New Zealand Winegrowers believed that developing guidelines for sustainable viticulture would help establish and embed good practice, and would also provide a valuable ongoing pathway for transferring results from industry research to producers. The first of this series of projects began in 2001 and aimed to implement systems to ensure production sustainability (SFF 01/131). This project included development of databases and database management tools that enabled key winegrape production issues to be identified and addressed.
33. According to Industry representatives and SFF project reporting, a subsequent project (SFF L03/024) supported a series of workshops being run around the country. They aimed to increase awareness of the implications of resource management legislation for the growing industry.
34. Industry representatives recall that the emphasis on developing sustainable production systems had a dual focus: it helped build a system of benchmarking that supported sustainability credentials, and it helped to communicate the sustainability story. The workshops supported both

these aims, and they also promoted closer links both horizontally across growers and vertically between the industry and growers – providing a technology transfer platform for other initiatives.

Being more energy efficient

35. Later, another two SFF projects added to the sustainability focus according to Industry representatives. In 2006 a SFF project (SFF 06/096) was established to improve the efficiency of energy use in the wine industry. First an energy use benchmarking system was developed. Next, all the winery process stages were audited on a number of case study wineries. From this project, a toolkit was developed which enabled winemakers to assess their own performance and address areas for improvement.

Steps to improve sustainability

36. Another project built on the efforts some wineries were making to establish integrated environmentally sustainable practices and produce residue-free wines. In 2007, project SFF 07/123 aimed to minimise chemical inputs on vineyards while improving or at least maintaining effective pest and disease control. The project had two main elements, each with different activity streams.
- The first workstream comprised an evaluation of best management protocols for effective botrytis control and nil-residue wine production. The project primarily focussed on *Botrytis cinerea*, the cause of botrytis bunch rot in wine grapes, because it was the primary disease facing New Zealand winegrowers, and residues detected in wine were also most likely to result from synthetic fungicides applied for botrytis control.
 - The second work stream developed extension and education materials, including on-line decision support tools for vineyard managers. According to Industry representatives, stronger relationships between the research team, senior wine company representatives and vineyard managers were a positive result of this project.
37. Together these joint research initiatives also encouraged the industry, working through New Zealand Winegrowers, to develop a Sustainability Policy in 2007. This aimed for all New Zealand wines to be produced under independently audited environmental programmes by 2012. The Policy was intended in part to promote participation in SWNZ but also recognised other environment-based programmes. It was successful, and it is estimated by New Zealand Winegrowers that today more than 94% of the producing vineyard area is participating in SWNZ, and a further 3–5% is under certified organic programmes.

These projects have contributed to a number of ongoing industry systems. SWNZ has been adopted. Similarly the industry now regularly engages in benchmarking around practices such as energy use and water. As this work progresses it helps us

move towards setting refined KPIs (key performance indicators). [Industry representative]

Protecting crop quality

Leafroll virus eradication

38. As the industry became more established, different research priorities arose. Eradication of leafroll virus is currently regarded as a top research priority by New Zealand winegrowers. Already endemic through the North Island and Marlborough (the country's largest wine growing region), leafroll virus can spread rapidly through an entire region via its main vector – mealybugs – and severely reduces wine yields and returns. Four to 12 years after planting, vineyard blocks may reach vine infection rates of 100%. Beyond a threshold of around 20% the virus begins to affect crop yields and degrades fruit quality to such an extent that wine quality must be downgraded from premium to commodity – resulting in significant reductions in the per-bottle price.
39. The leafroll virus particularly affects premium red varieties such as Pinot Noir and Syrah, which comprise around a quarter of the national vineyard. The virus also adversely affects white varieties, which remain problematic because they often show no visible signs of infection. With a goal of consistently producing ultra-premium quality wines, New Zealand growers cannot continue to sustain the financial impact of leafroll virus, according to Industry representatives.
40. The SFF project 09/144, initiated in 2009, pioneered an integrated programme to combat leafroll virus in two case study areas. While research continues into approaches to control the mealybug vector, this programme looked to provide best-practice guidelines for the removal of infected vines. The 1,000 ha trial reflected the need for control to be conducted on an area-wide basis in order to be effective. This project developed preliminary best-practice guidelines for the removal of individual infected vines. Industry representatives confirmed that growers in the pilot areas quickly adopted recommendations for the visual identification of symptomatic virus-infected vines, and tagged them for removal post-harvest. This was a significant undertaking for vineyards: the total cost to growers of removing more than 100 ha of infected vines in Gimblett Gravels area alone was around \$8,500,000.
41. In 2012 a further SFF project (SFF 12/073) built on the success of this pilot to roll out an industry-wide leafroll virus management programme. This project will initiate the world's largest field trial to evaluate treatments for re-planting vines in virus-affected areas, and is underpinned by wide industry support. As such, the current project extends activities beyond the earlier pilot – as it moves beyond just removal to look at best practice for replanting. It also includes the first international field trial to assess the effectiveness of grafting red indicator varieties among white varieties to enable growers to monitor for virus symptom expression.

42. We believe the technology and extension component of SFF12/073 illustrates best practice. Extension activities are built in to each project from the beginning, and efforts are made to share information in a number of ways to make it easier for growers to access. Vineyard mapping techniques and case studies are being presented to growers at regional events. Also a range of fact sheets, social media and videos presenting best practice are easily accessible to growers via the well-established New Zealand Winegrowers website. These are also being provided in electronic forms for tablet and PC computers.

Managing crop yield within specified targets

43. Industry representatives and MPI Advisers pointed out that another crop issue for growers is managing yield within specified market production targets. The 2011 SFF project (SFF 11/110) looked to develop mechanical thinning as a viable tool for growers. In the years leading up to this project (2008–2011), grape yields rose above contracted targets so that growers had to remove fruit to avoid being penalised. Growers generally hand-thinned vines, which is a labour-intensive and time-consuming exercise costing in excess of \$700/ha⁶ and so growers are interested in cost-effective methods for controlled thinning.
44. This programme builds on an earlier industry-funded pilot research programme that studied the use of machine harvesters to thin vines. Initial concerns that machine thinning would increase the risk of botrytis disease proved unfounded. Instead, machine thinning provided the same or lower incidence and severity of botrytis rot as control plots, according to Industry representatives. The 2011-initiated mechanical grape-thinning project has now extended trials to evaluate thinning on a range of different varieties. Field trials are currently being undertaken in Marlborough and in Hawke’s Bay.
45. The project also aims to develop best-management protocols for adjusting the machine settings for different conditions. Again, this research was possible because of the close links that were established through earlier projects between growers, wine companies and the research sector. As Industry representatives pointed out, often SFF projects become practical if they build on earlier underpinning research.

These research initiatives have contributed to wider efforts by New Zealand Winegrowers to create an industry that actively seeks to link research with practice. This leads to growers wanting to be involved in early field trials, and a wider industry looking to take up subsequent best practice findings. [Industry sector representative]

46. The evaluators believe that collectively these research projects illustrate how building strong industry–research partnerships facilitate research findings being used on-the-ground. They demonstrate how SFF projects can build on more targeted research activities, and find direct applications in the production sector.

⁶ Neal et al. 2010.

To what extent do these projects demonstrate value for money?

47. Value generated from this SFF investment has many dimensions including social, environmental and economic. In this final section of the case study, the evaluators reflect on the outcomes we identified within these three broad dimensions.

Social dimensions

48. We believe this case study provides an excellent example of social and organisational capability and capacity-building occurring at individual, community and sector levels. These research initiatives contributed to New Zealand Winegrowers' efforts to develop an industry that actively links research with best practice.
49. This cluster of projects is notable because it was implemented at an industry-wide level from the start. From the beginning, project implementation placed an emphasis on managing good communication between all the key industry stakeholders and the industry's confidence and skills in this area have grown over time.
50. Ongoing efforts over time to involve and engage people in a range of projects mean that the industry developed an inclusive culture. This led to growers wanting to be involved in early field trials, and a wider industry that is well placed to take up subsequent best-practice findings.
51. We note that thoughts about how to transfer findings out to the wider industry and to find forums to talk about the next subjects for research often do not occur until the end of a project. However, this cluster of NZ Winegrower projects provides an excellent exemplar of the benefits of including technology transfer and extension in project planning from the start, and throughout the course of the one to three year activities.

Environmental dimensions

52. This cluster of wine industry projects provides an excellent example of strong environmental standards being developed and incorporated in farm and industry-level systems. The incremental nature of the 10 projects included in this case study supported ongoing improvements in the sustainability and crop quality aspects of the entire wine industry. Research and extension activities kept up with industry aspirations as they emerged, and ensured project participants were well placed to address emerging challenges and opportunities.
53. As noted by industry representatives, the wine industry was quick to see the opportunity back in the 1990s to leverage off environmental credentials, and respond to market opportunities for high-value wines. Sustainable production was supported by benchmarking and developing best practice in a number of key areas including energy efficiency use and the provision of wines that are residue-free. Environmental standards are now incorporated in both vineyard and industry-level systems and are reflected in the New Zealand wine branding. It is estimated by NZ

Winegrowers that today more than 94% of the producing vineyard area is participating in SWNZ, and a further 3–5% is under certified organic programmes.

54. As the wine industry evolved, SFF projects shifted to address research challenges based more around crop quality. Consecutive SFF projects in 2009 and 2012 culminated in the roll-out of a national industry-wide programme for leafroll virus management. The leafroll virus management project has wide industry support and will initiate the world's largest field trial to evaluate treatments for re-planting vines in virus-affected areas. Another recent project assists development of best practice in mechanical thinning.

Economic dimensions

55. There is clear evidence that SFF grants have contributed to helping the viticulture industry position itself as a premium wine producer. Protecting the quality and productivity of this industry helps facilitate ongoing market access and premium pricing – and therefore the viability and profitability of an industry currently earning \$1.7 billion per annum (international and domestic markets combined).
56. The database shows that the 10 SFF projects cited in this case study were funded through SFF grants of \$2.9 million and industry contributions of \$3.2 million, for a total of \$6.15 million. For every \$1 of SFF funding, \$1.11 has been contributed by other parties. On an annualised basis, the investment in these projects equates to 0.03% of the annual income of the viticulture industry (or \$1 per \$3,300).
57. On this basis, we estimate the SFF projects would break even if they contribute to preserving or growing just 0.03% of industry income. Bearing in mind the known impacts of the projects, there seems a credible prospect of a positive rate of return on the SFF viticulture projects.⁷
58. A 2009 NZIER report⁸ cites Australian research (Zhao et al 2002) that found it is only the very largest wine producers who are able to invest substantial amounts in public good type research and development that can benefit the whole industry. The SFF has provided a way to compensate for this market failure by enabling wider participation in viticulture research and development.
59. Industry representatives identified that learnings from the SFF projects strongly supported thinking behind SWNZ and other certified organic programmes that have been adopted by nearly 100% of the industry. Through these programmes, the potential for positive influence by local projects on national best practice is significant. We believe that without the SFF, similar steps would have been taken eventually. However, SFF

⁷ It is beyond the scope of this study to directly estimate the economic impact of the SFF projects' contribution to protecting and enhancing the value of a premium export industry (e.g., Cost Benefit Analysis). Moreover, the value of this contribution would be difficult to attribute given the many other influences on the industry.

⁸ Ballingall J, Schilling C. 2009.

has enabled a suite of projects to happen sooner and the learning to be picked up more quickly than might otherwise have occurred.

60. Two examples, leafroll virus and energy efficiency, illustrate the potential economic value of viticulture projects that received SFF funding in terms of safeguarding revenue and exports.
61. Grapevine Leafroll-associated Virus Type 3 (GRLaV-3) causes significant financial impact to commercial vineyards. Taking into account costs of foregone income and vine replacement, GRLaV-3 has been estimated to cost growers up to \$57,618 per hectare (NPV basis).⁹
62. If there are 29,810 productive hectares of wine grapes (NZIER, 2009) of which 25% are varieties particularly susceptible to leafroll (as already noted in this case study), this implies maximum potential losses of \$425 million. The combined SFF and industry investment in the leafroll project represents 0.33% of maximum potential losses. Correspondingly, the investment would break even if it contributes one-third of one percent of the reduction in maximum losses from leafroll vine infections.
63. In the final SFF report the energy efficiency project found “almost a universal desire” to address energy use efficiency gains in wineries “but in many cases a lack of knowledge of how to go about it”. The project provided a tool enabling wineries to assess their own performance and address areas of improvement. It was estimated that wineries with an average benchmark figure may be able to achieve energy savings of 15-20% and in some cases in excess of 50%.¹⁰
64. The energy efficiency project was undertaken with SFF grants of \$171,250 and industry contributions of \$99,719, for a total investment of \$270,969. In the last energy benchmarking survey, potential savings of \$700,000 per annum were identified for 130 wineries (Philip Manson, personal communication, 2013). On this basis, the SFF investment could be recouped through less than a year’s worth of energy savings.

⁹ New Zealand Winegrowers. August 2009

¹⁰ Final report of SFF project 06/096: *Strategy for improving energy use in the wine industry*.

Acknowledgements and References

References

65. This case study narrative and value for money assessment has been compiled using a range of literature including SFF proposals and reports for the following projects:
- 01-131: Implementation of systems to benchmark and improve the sustainability of NZ wine grape production practices under sustainable winegrowing NZ
 - 03-141: GIS mapping of the national vineyards for the wine industry
 - 03-143: Focus vineyards: what is the best practice and how to improve adoption of this best practice?
 - L03/024: SWNZ workshop series to increase awareness of the implication of Resource Management legislation for the wine industry
 - 06/096: Strategy for improving energy use in the wine industry
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Acknowledgements

66. We would like to thank all those we interviewed during the development of this case study. These comprised three New Zealand Winegrowers' research and sustainability staff who collectively have been responsible for the successful implementation of these SFF projects (referred to in this

Three case studies: companion document to the Evaluation of the Sustainable Farming Fund

case study as industry representatives) and two MPI Advisers with good knowledge of the projects. Their comments, enthusiasm and contributions to the development of this case study were invaluable and much appreciated.

67. The lead researcher for this case study was Dr Will Allen, with support from Julian King and Judy Oakden.



3 Case: Top of the South: Setting an example for sustainable water quality

Overview

*The work on the Sherry was pioneering. It set a level of expectation for our rivers and streams, and demonstrated that improvements can be made. [Getting] cows out of streams returned quick results [and the] improved effluent management can pay for itself over time. But when it comes to dealing with run-off from land, it is much slower to make improvements and effect meaningful results.
[SFF Project Manager]*

68. New Zealand needs to reduce contaminant losses from farms to waterways, and begin to reverse the degradation of our waterways. Apart from the benefits for the environment, it is necessary from an economic standpoint to protect the international reputation of our agricultural industries by ensuring they meet consumer demand in some parts of the world for responsibly produced goods – thereby protecting the ongoing market.
69. In practice, addressing water quality issues is complex, technical and takes extended periods of time. Three SFF projects in the top of the South Island (between 2006 - 2012) together developed an effective model of collaborative action to improve fresh water quality in a catchment.
70. These projects left their farming communities with working plans for ongoing activities that will cement further improvements in water quality over coming years. Farmers were encouraged as leaders of positive change. The projects also facilitated greater connectedness or social capital within the communities through partnerships between land managers and a wide range of other stakeholders including scientists, central and local government, and community and industry facilitators.
71. These projects in the Sherry, Rai and Aorere catchments each featured significant participation by dairy farmers, and we have highlighted the challenges and benefits facing this farm sector through this performance story. Dairy farmers provide a window on the multi-level and complex challenges communities face as they manage water quality issues. Their stories also demonstrate the value of community-level approaches to catchment management, and the need to develop partnerships with Councils, neighbouring communities and industry.
72. With annual exports in excess of \$13 billion, the dairy industry is New Zealand's largest export earner. Dairy productivity has risen markedly over the past decade, with increases in both cow numbers and milk yields

per cow. At the same time, dairy farming is being increasingly held to account for associated environmental impacts including water quality.

73. Investment by the SFF and partners in the projects has resulted in demonstrably high levels of compliance with good management practice (e.g. Fairfax NZ News 2013). Water quality is not improved overnight, but significant steps have now been taken to arrest its decline and put in place measures for its improvement. These steps were undertaken by the full range of primary land users in the region.¹¹ Positive outcomes have been achieved for an SFF project investment across two projects (the Aorere and the Rai) of \$477,000,¹² and a further \$2.2m from industry partners (including past and anticipated investment in best management practices) – less than 2% of projected 15 year dairy income for these catchments.
74. The three projects included in this case study are outlined in the following table. This table provides details of the project title and timeframe, the SFF funding received, and the total project funding which includes the value of in-kind support.

Table 2: Summary of SFF projects included in the 'Top of the South: Setting an example for sustainable water quality' case study

Projects	SFF Funding	Total project funding
06/005: A community approach to improving catchment well-being – Aorere Catchment (2006 – 2009)	\$218,000	\$436,000
07/113: Improving water quality through whole catchment planning – Sherry Catchment (2007 – 2010)	\$95,000	\$198,450
09/160: Farmers as leaders in water quality action – Aorere & Rai Catchments(2009 – 2012)	\$259,000	\$585,500
Total	\$572,000.00	\$1,219,950.00

Context

75. Fresh water is used in many ways and sustains multiple values, such as supporting aquatic life, drinking water supplies, agricultural, horticultural and aquaculture production, cultural values and water-based recreation. These sometimes complement each other – and sometimes conflict. To maximise New Zealand’s economic opportunities while also protecting and enhancing our natural environment, we need ways to manage fresh water that recognise and address the tensions that can arise between groups focusing on different uses of a finite resource. In particular, we need to find approaches that are less confrontational, more collaborative and more effective (Fenemor et al. 2011).
76. Government and industry have responded to these challenges over the last 10 years with the introduction of national policies, regional plans and

¹¹ Examples of land users include dairy, sheep and beef farmers, and forestry managers

¹² \$477,000 is the total investment for Aorere and Rai combined. We have not included Sherry in this part of the story because we don't have their dairy turnover data, and there is a range of other land uses included in the Sherry project.

good management practices to safeguard our freshwater resources. The dairy industry in particular is looking at best practice in this regard, most recently updating this through the *Sustainable Dairying: Water Accord* launched in July 2013.

77. The dairy industry also provides a good example of the challenges of balancing agricultural production and environmental protection. With annual exports in excess of NZ\$13 billion,¹³ the dairy industry is New Zealand's biggest export earner. Around 95% of New Zealand's milk is exported, and the industry employs 37,000 people.¹⁴ Dairy productivity has risen markedly over the past decade. In the 1992/93 season the average dairy cow in New Zealand produced approximately 259 kilograms of milksolids (kg MS) and in 2008/09 the average dairy cow produced 323 kg MS. This per-cow increase is the result of genetic gains and improved farm management, including improvements in stock nutrition. The long-term improvement in productivity has coincided with an increase in cow numbers from 2.7 million in 1993/94 to 4.4 million in 2008/09.
78. At the same time, dairy farming is being increasingly held to account for associated environmental impacts. The advocacy group Fish and Game started a New Zealand-wide "Dirty dairying" campaign in 2002 to highlight the effect of dairying on fresh-water quality.
79. The Dairying and Clean Streams Accord was established in 2003 by the largest dairy company Fonterra along with a range of partners, to encourage specific practices including effluent management and stock exclusion from rivers and streams. This has recently been replaced with a new set of national good management practice standards aimed at lifting dairy farm environmental performance. It includes commitments to targeted riparian planting plans, comprehensive standards for new dairy farms and measures to improve the efficiency of water and nutrient use on farms. All dairy companies and the dairy farming industry-good organisation DairyNZ will be accountable for its commitments, and farmer uptake will be supported through supply contracts and support programmes.¹⁵
80. However, as the following cluster of Sustainable Farming Fund (SFF) water quality project case studies highlight, there is no simple way to address the complex interactions of primary industry activities across the diverse environments in New Zealand.

Key stakeholder groups

81. A number of other stakeholder groups (or representatives) played a key role in the evolution of each SFF project, in addition to the farmers directly involved in each of these projects. These included: the local Landcare Trust regional representative, Tasman and Marlborough District

¹³

http://www.dairynz.co.nz/page/pageid/2145879933/Sustainable_Dairying_Water_Accord

¹⁴ <http://www.dcanz.com/about-nz-dairy-industry/dairying-today>

¹⁵ <http://www.dairynz.co.nz/news/pageid/2145879996>

Councils, researchers from a range of agencies (Landcare Research, NIWA, Cawthron Institute, Wriggle – Coastal Management) as well as other important stakeholders who border the catchments in question such as mussel farmers, tourism enterprises and the Department of Conservation.

Case Study Performance story

82. These three case studies provide examples of rural communities addressing water quality issues in their local catchment. The projects, all located in the Top of the South Island, highlight how individuals and communities need to be engaged to become part of the solution.

Improving water quality through whole-catchment planning

Introduction

83. Work to improve water quality in the Sherry River catchment commenced in 2001, and this case study illustrates how these efforts were supported by an award-winning SFF project that ran between 2007 and 2010.
84. The Sherry River catchment in the upper reaches of the Motueka River catchment covers almost 8,000 hectares. It is a tributary of the Wangapeka. Land use in the catchment is a mix of forestry and pastoral farming – including dairy, sheep, beef and deer, and as such it is representative of many catchments throughout rural New Zealand.

Prior to SFF

85. In 2001 research from the Motueka Integrated Catchment Management (ICM) research programme highlighted particularly high levels of bacterial contamination, indicating that the lower reaches of the river were becoming unsafe for swimming. Specific issues included high E.coli levels exceeding safety standards for bathing and stock drinking, high levels of suspended sediments, and a lack of shade in some reaches causing raised water temperature which directly affects aquatic life. It also highlighted to the local community how water quality problems can creep up on them as land use becomes more intensive.
86. As a result of the pre-SFF research carried out in the Motueka ICM project, three major bridges were built over the Sherry River enabling cows to be kept out of the river. A fourth bridge, formerly only used for farm vehicles, was also used to cross cows. Subsequent measurement showed these actions alone contributed to a 50% reduction in levels of E coli.
87. However, ongoing monitoring showed the need for further improvement to meet the guidelines for recreational swimming. Meetings facilitated by the New Zealand Landcare Trust in conjunction with the Motueka ICM programme brought landowners together as a Catchment Group. However, having developed a group, resources were needed to support

the range of farmers in thinking about the wider problem and how it related to wider farming practices. This required resources beyond the group such as expert support, facilitation and project co-ordination services.

SFF project for Sherry River

88. This was a key point from which the Sherry River SFF project was developed. An SFF project titled: "Improving water quality through whole catchment planning"¹⁶ began in 2007. According to the Project Manager (continuing the facilitative role by New Zealand Landcare Trust) and MPI Advisers, this provided for a whole-catchment approach involving a range of land-based operations – including all working farms.
89. According to the Project Manager, and based on SFF project reports, key activities included developing management activities along waterways (the riparian strip) and individually tailored Landowner Environmental Plans (LEPs). A project steering group worked directly with a Farm Environmental Adviser to develop a plan to engage farmers and arrange supporting informational and educational material. Related tasks completed through the course of the project included: managing field days, developing community-led implementation initiatives, and producing a final report. This work has also contributed to plantings and fencing along waterways.
90. According to milestone reporting, LEPs were completed for 15 properties during 2007–2009. These included all working farms – dairy, sheep and beef farms, a free range poultry farm and other small landowners in the catchment as well as environmental harvest planning by the two forestry companies in the catchment. The process for developing an LEP normally comprised a walk-over inspection of the property with the landowner, followed by drafting of maps (soils, land capability, waterways) and proposed land management actions for review and discussion with the landowner. The plans covered a wide range of farm activities including management of riparian areas, effluent, nutrient, pasture, stock movement, and earthworks and roading. The draft LEPs also prioritised the actions taking into account their likely effects on water quality, cost, and practicality. Each plan was then finalised with the landowner.
91. The Project Manager, and MPI Advisers reflected that this SFF project demonstrated that with suitable encouragement, collective voluntary action in a catchment can work to achieve environmental outcomes sought by the wider community.
92. However, planning at a whole farm level is complex, and requires a range of solutions that need to be implemented within a long-term approach. A District Council scientist observed that the Group has moved towards its primary aim of making the river safe for recreational use. The scientist noted that since monthly testing began in 2003, contamination in the

¹⁶ (SFF 07/113)

Sherry¹⁷ reduced by around a third, from 435 E.coli/100ml in the period of 2003-2007 to 275 E.coli/100ml in the period of 2008-13. The scientist also pointed out that managing water quality improvements requires ongoing efforts across a range of fronts. However, the largest gains in contamination reduction came fairly soon after the big projects, such as the bridges that removed the stock from the major waterways.

Subsequent work to address runoff from the land needs to take account of all the other aspects of best practice covered in the Landowner Environmental Plans. These plans always need to be individually tailored for each situation, and require ongoing effort and commitment from land managers. [Scientist]

93. NZ Landcare Trust's Nelson-Marlborough coordinator, who acted as SFF Project Manager, said the Sherry River community rose to the challenge of improving water quality and this, along with work done in the Aorere River catchment in Golden Bay and the Rai Valley, provides a blueprint for rural communities wanting to develop collective approaches to local catchment management. The Project Manager pointed out that because water quality reflects what happens across the whole catchment, it is important to ensure that all land managers in the catchment are ensuring best practice on their properties.

National and international recognition

94. The Sherry River SFF project was recognised at national and international conferences: it was first-equal winner of the Tasman-Nelson Environment Awards and has since won a 2011 Green Ribbon Award. It was also recognised regionally and the Tasman District Council has allocated funds to support the development of Landowner Environmental Plans. Most recently the Sherry River catchment community was one of two winners of the inaugural 2013 NZ River Awards "River Story Award" for community action. This project is a good example of how community groups can commit to action that carries on far beyond the life of supporting grants.
95. The next sections of this case study highlight the outcomes that have emerged from related water quality SFF projects in the Top of the South.

A community approach to improving catchment well-being

96. The Golden Bay community is particularly sensitive to faecal bacterial contamination in the water, given the local importance of aquaculture with its stringent food safety requirements. Between 2002-2007 the \$15 million-a-year Collingwood Mussel Farms were under real threat of closure, because microbial contamination was reducing the local shellfish industry's harvesting window from around 70% of the year to as low as 30%. Marine farmers were desperate for improved water quality and threatened the District Council and local dairy farmers with legal action in 2004.

¹⁷ measured at Blue Rock in the lower Sherry.

97. As the project brief (SFF 09/160) highlights, only 16% of the catchment of the Aorere River, which flows into Golden Bay, is in farming and the remainder is in native vegetation. Dairying is the most common farming type in the catchment, running approximately 11,000–13,500 cows and generating around \$15 million per year. The dairy farmers typically run owner-operated businesses. Water quality is generally good, although high rainfalls (3.5–4.5 metres/year) exacerbate contaminant runoff.
98. In response to the marine farmers and threatened legal action, the pastoral farming community began to work collectively to understand and address the issue. The New Zealand Landcare Trust was brought in to help facilitate discussions amongst the stakeholders involved. These discussions resulted in the development of a SFF project (SFF 06/005) titled: "A community approach to improving catchment well-being", and the project ran from July 2006 to July 2009. In early good news for the project – and thanks to the efforts of the local farming community – shellfish harvest days were lifted to 79% in the Collingwood/Aorere area in October 2007.¹⁸
99. The project was managed by Project Managers from New Zealand Landcare Trust, and their roles also involved supporting the relationship building and discussions required for wide community buy-in to the project. Specific SFF project activities included: farmer interviews, an initial specialist overview of nutrient and pathogen impacts in the catchment, presentations and field days to allow peer-to-peer interaction and discussion, and assistance with developing tailored farm plans based on accepted 'best-practice' management.
100. Key achievements by 2009 included:¹⁹
- creating a farmer-led catchment group with full community support
 - commissioning a scientific model of contaminant sources from the catchment to the river and surrounding bay
 - providing individual farm plans for 14 out of 33 farms – outlining \$1.4 million in on-farm investments for water quality improvement
 - reducing community tension and building relationships between the farming community, Council and marine farmers.
101. According to the Landcare Trust report, during the three-year SFF project a number of farmers made significant investments in work to improve water quality, such as effluent systems, fencing and culverting. For example, the Project Manager referred to one farm commissioning an effluent pond that could store three months' worth of effluent, with weeping wall filtration and low-rate effluent irrigation - which is now used as a model for field days.

¹⁸ NZ Landcare Trust 2008

¹⁹ NZ Landcare Trust (2009) Aorere: Our river Our future

What is important is that communities define their own problems clearly, in terms they can understand. This thinking has now been incorporated into other catchment initiatives around the country. [Industry representative]

Farmers as leaders

102. The Project Manager and MPI Advisers recall that to provide the opportunity for others to learn from the experiences to date, the Aorere project was extended and paired with another at-risk catchment, the Rai Valley. They observed that coupling the two catchments provided a good chance for farmers in both catchments to learn more about the best way to manage whole-catchment community processes. This was developed as SFF project (09-160) that started in 2009 and aimed to empower “farmers as leaders”.
103. According to SFF project reporting, the Rai river catchment supports around 19 farms in the Marlborough District (running approximately 4500 cows), and around seven farms in the Pelorus Valley. Like the Aorere, the catchment is steep, has high annual rainfall and is predominantly forested, with dairying on the valley floors. The Rai discharges to the Pelorus River and is popular with kayakers, anglers, swimmers and an Outward Bound outdoors activity course. The Pelorus River runs past a further seven dairy farms and enters the Marlborough Sounds at Havelock, forming an extensive estuary. Once nutrients get into this enclosed estuary, the opportunities for flushing are limited, increasing the potential for adverse impacts from farm runoff. Already signs of excessive nutrient loading are present. The lower Rai River has, on occasions, had to be closed to recreational users. In the early 2000s the Rai was the focus of several negative newspaper, radio and published reports.
104. This ‘Farmers as Leaders’ project built and implemented a farmer leadership model that more effectively addressed water quality issues in intensively farmed catchments. Project reports show this model involved groups investigating their own problems, often through commissioning science reports, and then managing issue recognition and solution development phases. In particular, the project also provided significant peer mentoring and information-sharing opportunities by directly linking farmers with other farmers across the two catchments according to the Project Manager.
105. In this most recent water quality project, farmers were both role models and mentors. A good example of a peer-to-peer technology transfer approach is evident in approaches to improve on-farm effluent management, in particular addressing the need for reasonable storage and low-rate application to land. Lessons were learnt across projects. For example, a substantial upgrade to a Sherry River catchment dairy farm’s effluent system provided a focus for project field days, to promote awareness and discussion among farmers from other catchments. The SFF Project Manager, MPI Advisers and project milestone reports all indicate that technological development has occurred. For example, the first weeping wall system in the top-of-the-South catchments was installed

with a clay lining, while some of the more recent systems use synthetic liners. As a local scientist pointed out, the use of these different lining systems is ultimately dependent on the underlying soil permeability of the property involved.

This upgrade and subsequent further work on the system highlights the evolution and growing complexity of some of the technologies, and risks associated with their early adoption. that are being developed. It also shows the need for individual land managers to be willing to make significant investments and change day-to-day practices. [Project Manager]

106. Following the SFF project, key achievements in the Rai catchment (according to the milestone reporting) are as follows:
- a programme for developing farm plans was established as part of this development, including arrangements for Marlborough District Council to contribute half the costs of developing these plans beyond the life of the project. Six of these farm plans were developed in the past 12 months
 - a joint approach to riparian plantings has been developed between farmers and a number of key stakeholders in the area, including Fonterra, Outward Bound, King Salmon, NZ Landcare Trust (NZLT) and Department of Conservation
 - a farmer-led nursery for native plants suitable for riparian and restoration plantings was established, which is now supported by Outward Bound, King Salmon, NZLT and the Department of Conservation.

Collective problems need collective solutions. Farmers need to work with a wide range of other people and groups. [Project Manager]

To what extent do these projects demonstrate value for money?

107. Value generated from this SFF investment has many dimensions including social, environmental and economic. In this final section of the case study, the evaluators reflect on the outcomes within these dimensions.

Social dimensions

108. The evaluators found this series of projects provides an excellent example of SFF projects helping to build social and organisational capability and capacity. There is very good evidence of this occurring at individual, community and sector levels in this case. All three projects contributed to the development of environmental plans that outlined best practice for individual properties. They directly supported the development of community groups, which all carried on beyond the life of the projects. Individuals emerged as farming leaders through these projects (many of them women). These projects also highlight the importance of creating opportunities for mentoring across farmer groups.
109. We found clear examples of how, through their involvement in these programmes, these catchment communities developed stronger networks

with professionals from research and council sectors. These projects directly built links for use by the community groups in the future. Conversely, these links provided researchers and council staff with valuable opportunities to gain a better understanding of individual farming systems. We believe that this enhanced understanding will aid the development of new research and policy initiatives that are better targeted to positively integrate with on-farm management systems.

110. We found these projects also contributed to the development of community-building and facilitation skills among independent professionals (such as NZ Landcare Trust staff) with particular expertise in sustainable agriculture. These skills can also be used in other rural catchments seeking to develop collective responses to water quality and other resource management issues.
111. We believe this cluster of projects provides a very good illustration of the way farming related knowledge and technologies can be scaled up, from an individual, to the local community, the wider region and the wider sector and to a national level. Collectively, these projects demonstrate the importance of developing local solutions to local problems through involvement of the community. They highlight the importance of using farmer champions to mobilise change across projects and catchments.
112. According to an industry representative the lessons learnt through these projects, around how to effectively support on-farm change at a catchment level, are being incorporated into industry initiatives through DairyNZ and other agencies around the country. Another way in which the lessons learnt are being shared more widely is through extension initiatives, such as the Landcare Trust's recent initiative to incorporate the lessons from these projects into a master class on whole-catchment planning. This is aimed at Council and Government agency staff.
113. Taking this "farmer-first approach" is building leadership and resilience within the farming community, and this in turn enables farmers to proactively develop appropriate practices and systems that support resilience in the face of increasing community expectations around the environment. As noted by one facilitator:

Farmers have one of the highest rates of suicides of any group. For each quad bike fatality that we hear of, there are 18 suicides [that we don't hear of]! [Facilitator]

114. The evaluators note that it is useful to adopt approaches that recognise and build from the strengths in the farming community – an approach that builds mana and self-esteem. This is preferable to blaming farmers for environmental damage, and trying to effect change using a deficit-based model.

I have personally noticed an attitude shift from denial ("it must be some other source") to anger ("this will put us out of business") to quiet acceptance and getting on with it. The farmer-led process empowers people. [Scientist]

Environmental dimensions

115. The evaluators found these projects have brought about long-term land management changes that have improved water quality, serving to both reduce the impacts on the environment in these catchments and to demonstrate what can be done in other catchments. They demonstrate how farmers can be more closely involved in identifying the targets that need to be achieved, and how to go about achieving them. Better environmental standards are being incorporated through the development of targeted LEPs. While the concept of farm plans is not new, and many have been done over the years, their implementation on these SFF projects has demonstrated how they can be better designed to address holistic environmental outcomes such as improved water quality.
116. Greater use of environmentally sustainable practice is also evident amongst the farming community. For example, a recent Council survey in the Aorere demonstrated high levels of compliance with good management practice.²⁰
117. By developing good practice among the farming community, we note the potential for New Zealand's primary industries to better leverage off environmental credentials to respond to market opportunities and protect international market access. Industry recognition of this key driver is seen in the development of the new rules by the dairy industry (Fonterra and DairyNZ). From July 2013 they outlined minimum standards they expect from suppliers - to manage their farms in an environmentally sustainable manner. The sector acknowledges that these SFF projects contributed to their increased use of community-based approaches to support the introduction of more sustainable environmental practice change.

Economic dimensions

118. The evaluators observed that across the country agricultural communities are recognising that it is necessary to address water quality issues to protect the value of farm enterprises. While the projects referred to in this case study include a range of farm enterprises, we have used the dairy sector to provide an illustration of the economic dimensions that these cases provide.
119. We believe the investment by SFF and partners in the Aorere, Sherry and Rai projects has enabled these rural catchment communities to demonstrate high levels of compliance with good management practices, such as those set out in the Water Accord. Water quality is not improved overnight, but significant steps have now been taken to arrest its decline and begin to improve it. The practical implication of this over the longer term is a direct contribution to the way in which farmers in these areas demonstrate good environmental awareness and management. The size of this contribution can be put in perspective by looking just at the regional dairy industry in the Aorere and Rai catchments which has a

²⁰ (Fairfax NZ News 2013).

projected income of \$164 million over 15 years.²¹ These projects involved a total investment of less than 2% of that value (of which the SFF contribution represents 0.3% of projected dairy income for the Aorere and Rai catchments). On this basis, the total investment in these projects would break even if they make a 2% contribution to protecting the future value of the local dairy industry.²²

120. Furthermore, water quality degradation from dairy farming imposes an adverse externality on other industries. For example in the Aorere catchment microbial contamination had threatened a mussel farming industry worth \$15 million per year, reducing the local industry's harvesting window from around 70% to as low as 30% per year. Following farmers' investments in water quality measures, shellfish harvest days were lifted to 79% in the Collingwood/Aorere area. While the relationship of harvest days to total yield is not known, an increase of this magnitude is clearly significant. However, the evaluators acknowledge that water quality issues take a long time to address and remain a concern for mussel growers at this time.
121. Water quality also stands to affect economic performance of other industries, including recreation and tourism. Therefore the scenarios presented here represent a conservative estimate of total value.

Acknowledgements and References

References

122. This case study narrative and value for money assessment has been compiled using a range of literature.
123. SFF proposals and reports for the following projects:
 - 06/005: A community approach to improving catchment well-being
 - 07/113: Improving water quality through whole catchment planning
 - 09/160: Farmers as leaders in water quality action

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²¹ Based on Aorere dairy income of \$15m for up to 13,500 cows (from which Rai income was proportionately estimated at \$5m for 4,500 cows). Total dairy income for both catchments combined (\$20m) was projected forward over a 15 year time horizon with an assumption of no market growth and a discount rate of 8%.

²² It is outside the scope of this study to directly estimate the economic value of the SFF projects' contribution to improving water quality. Moreover, the value of this contribution would be difficult to determine given the many other projects across New Zealand working to address water quality issues.

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125. The lead researcher for this case study was Dr Will Allen, with support from Julian King and Judy Oakden.

4 Case : Sustainable development and podocarp restoration on Tuawhenua lands

Overview

SFF enables local people to be more involved in ecological research, which in turn provides for the ecological research to be better tailored to the needs of local people. Partnering in this way builds a two-way flow of communication. Local people learn about measuring and recording; scientists learn about local use, knowledge and applications. [Forest Ecologist]

126. The Tūhoe Tuawhenua Trust administers a large tract of land around Ruatāhuna, which is central to the identity and wellbeing of the hapu of Ruatāhuna and Ngai Tūhoe. The Trust seeks a future for Tuawhenua lands where the people and the lands are in harmony and thriving. As part of this, it seeks to restore podocarp on its lands while creating economic opportunities for Ruatāhuna people.
127. Three SFF projects, one that was completed in 2010 and two that run from 2013–14, are helping the Tūhoe Tuawhenua Trust to develop a holistic and natural approach to the utilisation and restoration of native forest blocks. According to the Trustees, the SFF projects have supported the local community to gain valuable understandings of forest dynamics, suitable planting and husbandry techniques, and potential marketing strategies. The SFF projects are underpinned by Māori principles to ensure the outcomes meet local people’s aspirations. Trustees also acknowledge that the projects have also provided the opportunity for the Trust to build wider partnerships and networks that will support future management initiatives.
128. The Trust’s long term vision for forest restoration recognises the 500-year plus timescale required for podocarp regeneration. Already, however, Trustees point to good progress on environmental improvements as a holistic and natural approach to the utilisation and restoration of Trust lands has been developed, and implementation has started.
129. It is too early to link these SFF projects with an economic return from indigenous sustainable forest management on Trust lands. Nevertheless, Trustees and MPI Advisers believe the research has identified a way forward that may, over time, show economic potential associated with developing the market for indigenous timbers. In the Tūhoe context such economic returns, if realised, could contribute to future local economic potential through increased self-sufficiency and reduced state assistance.

130. The development of the sustainable management approach illustrates the importance of taking the time to engage people and think through the elements needed to underpin sustainable and culturally appropriate management. These efforts have left the community with a plan that suits their people and their lands. The plan highlights the efforts of Trust members as leaders of positive change within the wider community.
131. The three projects included in this case study are outlined in the following table. This table provides details of the project title and timeframe, the SFF funding received, and the total project funding which includes the value of in-kind support.

Projects	SFF Funding	Total project funding
08/060: Podocarp restoration on Tuawhenua lands (2008 – 2010)	\$139,170	\$178,230
M2-144 (In progress): Ensuring sustainable productivity of steep land tawa-podocarp forests (2013 – 2015)	\$80,000	\$100,000
M2/145: (in progress) Ensuring sustainable productivity of steep land tawa-podocarp forests (2013 – 2014)	\$86,280	\$123,220
Total	\$305,450	\$401,450.00

Context

132. The Tūhoe Tuawhenua Trust administers a large tract of land around Ruatāhuna, which is central to the identity and well-being of the hapu of Ruatāhuna and Ngai Tūhoe. The Trust seeks a future for the Tuawhenua lands where the people and the lands are in harmony and thriving. As part of this, it seeks to restore podocarps (native hardwood trees) to previously logged forests on the Tuawhenua lands which are now dominated by tawa forests. The project was also developed to create economic opportunities for Ruatāhuna people.
133. As Trustees point out, forest restoration is one of the main aims for the Trust for a number of reasons. For tangata whenua their forest, or ngahere, is a major source of history, culture, spirituality and well-being. For the people of Ruatāhuna, their existence is tied inextricably with the nature of the forest, what it stands for, and what it provides. The Trust manages around 9000 ha of forest for 18,000 beneficiaries.²³ Around one-third of these forests were logged 40 to 50 years ago to extract valuable podocarp trees (mainly rimu) for timber. These formerly podocarp-dominated forests are now dominated by tawa, a lower value timber species.
134. Since the closure of the local timber mill in the early 1970s, Ruatāhuna has had no local industry to sustain its community. Consequently, the economic reality for most families in Ruatāhuna is either welfare, or part-time and intermittent employment.

²³ Allen and Doherty, 2005

135. For these reasons, Trustees point to forest restoration and sustainable development as the key foci for the Tūhoe Tuawhenua Trust, to meet environmental and economic expectations as well as for spiritual and cultural well-being of Tuawhenua people. The projects' significance can be seen in a wider context, as historical logging has left other North Island podocarp-tawa forests in a similar degraded state.

Key stakeholder groups

136. The projects involved, and networked with, a number of groups and activities:
- the Tūhoe Tuawhenua Trust – provided a Project Manager, appropriate administrative support and communication
 - hapu of Ruatāhuna – Ngati Manunui, Ngati Tawhaki, Ngai Te Riu/Ngati Kuri and Te Urewera – who provided project workers to find, plant and release podocarp seedlings on their lands
 - the local school – Te Wharekura o Huiarau –it provided the site for the nursery in the early stages of the project, and some of the school youth to be involved in the nursery and planting activities.
 - Landcare Research who provided ecological expertise
 - MPI Forestry and Local Operations Directorate
 - other contractors and foresters who willingly shared their knowledge and thoughts.

Case study performance story

137. The evaluators found the Sustainable Farming Fund (SFF) projects examined in this case study clearly illustrate how innovative work can be supported to achieve longer-term, community-defined goals.
138. According to SFF project reports, the Tūhoe Tuawhenua Trust was formed in 1987, after a long legal battle to quash the amalgamated title and return the lands of the Tuawhenua to their original hapu title. Most of the bush blocks of the lands about Ruatāhuna are under the Tūhoe Tuawhenua Trust, which administers 25 bush blocks, covering about 9000 hectares. About 30% of the forest was logged in the 1950s and 1960s.
139. The main aims of the Trust are to ensure that:
- the lands are retained in the ownership of the people of the Tuawhenua
 - the lands and forests are protected and restored as appropriate
 - the lands and forest generate economic benefit for the current and future generations in a sustainable manner.

140. Trustees acknowledge that opportunities for development are limited, due to the nature of the land and regulations that constrain development in this region. They point to different attempts to establish sustainable forestry in these blocks since the 1980s, initially through the recovery of 'dead and down' rimu and later by bringing in a partner to manage logging. However, neither initiative succeeded as an ongoing operation.
141. From 2003, the Trust worked closely with Landcare Research to develop a model that could work in the context of the Tūhoe Tuawhenua lands. The research highlighted that there is little podocarp regeneration in either logged or unlogged forests, and that tawa trees and ferns currently dominate the logged forest canopy and forest under-storey, respectively.²⁴ They also looked at knowledge and experience of podocarp restoration here and overseas, and initial recommendations for restoration plantings were developed.
142. In 2008, the Sustainable Farming Fund provided funding for a project (SFF 08/060) titled "Podocarp Restoration on Tuawhenua lands" to pilot the proposed model of a holistic and natural approach to the utilisation and restoration of Trust lands. Trustees say that the principles of this model include:
- using mātāuranga (knowledge) – both traditional and from modern science
 - moving forward with the knowledge and guidance of Tūhoe ancestors and remaining mindful of future generations
 - maintaining the natural composition and structure of the ngahere (forest lore)
 - recognising the need to care for endangered flora and fauna that are ecologically and culturally significant.
143. The Trustees see many benefits from a small-scale approach, including: allowing the Trust as tangata whenua to manage any forestry operations themselves; and enabling – and encouraging – the community to realise more value from the harvest. In turn, they say, this approach reduces commercial incentives to maximise harvest levels and makes lower, ecologically sustainable levels of harvest commercially viable. This approach contrasts with the experience of many in the Ruatāhuna community, who were employed in earlier logging and milling operations in the central North Island and elsewhere in the country. They were familiar with a large-scale commercial forestry model.

The project allowed us to think through the ethics of harvesting trees. This provided the opportunity to reflect on mātāuranga and ensure that we came up with an integrated holistic approach [to management]. [Tūhoe Tuawhenua Trust Trustee]

144. The project documentation highlights the range of stakeholders that were involved in the initiative, including Government agencies and local hapu

²⁴ Carswell et al., 2007

and other organisations. The four-year project started in winter 2009 and involved three main components:

- a podocarp restoration programme, which involved planting or releasing over 4000 podocarp seedlings, saplings and poles
- a canopy manipulation exercise, which involved Trust members (hapu) learning skills to intervene in tawa dominated forests, retain stable stands and enhance regeneration of podocarps
- a feasibility study of tawa extraction, involving three trials of extraction and milling tawa, and cursory market research.

Podocarp restoration

145. As the Trustees point out, earlier research work suggested that some canopy manipulation would be necessary in order to establish podocarp seedlings, and so in this project they undertook to plant podocarp seedlings and manipulate the canopy to maximise seedling growth and survival, and at the same time to benefit growth of existing tawa. This part of the project involved transplanting naturally occurring seedlings in the first stages of the project, and then releasing seedlings and saplings in later stages of the project. The SFF project report documents that this involved participants in transplanting more than 3,800 seedlings, releasing 455 seedlings, and releasing a further 270 poles and saplings.
146. Overall, Trustees report that the podocarp restoration component of this project successfully assisted the Trust to:
- develop a cost-effective and appropriate way to source seedlings
 - develop techniques for best transplanting and maintaining seedlings
 - understand how crucial data management will be to future management of our forests
 - begin development of the systems and competence required for forest data management
 - understand the need for and costs of on-going maintenance of seedlings over the long term
147. Trustees also acknowledge that the podocarp restoration also made a major contribution to a key outcome for the Trust from this project – the engagement of their people in Ruatāhuna. Four hapu were involved in podocarp restoration on their lands that are under the Trust. They say that through this involvement, around 25 people learnt about transplanting, releasing and data collection. They also have enhanced their own understanding of and interest in the management of Tuawhenua forests.

There is a need to take time to get a wide group of people to engage and think about how resources are managed in a sustainable way. [Tūhoe Tuawhenua Trust Trustee]



Canopy manipulation

148. Project participants also created two small canopy clearings (“coupes”) in November 2009 by felling tawa. As the Trustees say, this was done so Trust members could learn more about how podocarps can be restored within a tawa-dominant forest. The growth and survival of the podocarp seedlings as well as the growth of edge trees will be monitored over future years. Because of the slow growth of the trees, this is the start of a long-term project. It will also involve monitoring the change in light conditions and closing of the canopy gap over time.

Feasibility of tawa harvest

149. Project documentation highlights that the third component of this project tested the viability of tawa harvest through a literature search, a pre-feasibility assessment, tawa resource assessment, trials for tawa harvest and milling, and assessment of potential markets.
150. Project reporting shows that through the resource assessment the Trust has developed some conservative estimates to calculate a possible annual harvest rate. This work also identified an approach that combines coupe harvesting with single tree and small group harvesting.
151. According to Trustees the trials for harvesting enabled local people to develop their skill levels in felling and recovery, both through ground-based and heli-lifting operations. They point out that this work highlighted the need for efficient management of field operations and provided an indication of the range of harvest operational issues that would need to be managed for a sustainable operation.
152. The pilot milling operation used an outside contractor. Lessons were learned about the average conversion rates that can be achieved and the need to manage for borer and sap-stain fungi attack. The Trustees acknowledge a benefit from this project is that participation in these activities provided training in extraction and milling skills for a nucleus of people. It subsequently led to the Trust operation purchasing its own portable mill.
153. Marketing tawa proved a challenging activity according to the Trustees. Because it has not been in good supply in New Zealand markets for some years, it has become a casualty of substitution by imported hardwoods. Project reporting shows that current returns are about half of what can be expected from podocarps such as rimu and mataī. Nonetheless, some potentially positive trends were identified, including the growing preference for “blond” (light-coloured) timber similar to Tawa, and developing restrictions internationally on the harvest of tropical hardwoods. Through this project, the Trust members reflected that they

developed some key networks, and developed an understanding of opportunities for a range of market segments.

154. According to Trustees, this SFF project taught participants enough about the forest management approach of podocarp restoration and tawa harvest to be able to implement their own operation. This operation plans to begin with a batch harvest approach, taking tawa from small coupes as well as selected and few tree groups. It is expected that the logs will be mainly extracted by ground haulage and milled using a portable mill. The Trust plans to sell into a range of markets in order to secure sales and maximise returns. As experience grows, the Trustees expect that this activity will provide the basis from which to move to an on-going operation. They say that planting podocarps into the gaps created by the small coupes and few-tree group removal is expected to become an on-going exercise. Trustees maintain that an important benefit of this component of the SFF project is that key skills have been gained by Trust members in operations, planning and financial management.

Next steps – current SFF projects

155. All these learnings, however, are tempered by a number of issues that pose risks to the overall commercial or ecological viability of the Trust's forest management proposition. Accordingly, the Trustees point out that they have since initiated two further SFF projects to look further into these aspects. At the time of case study publication, these projects have been approved and are currently both in their start-up phase.

Ensuring sustainable productivity of steepland tawa-podocarp forests

156. One SFF project (M12-145) has been designed to develop robust and relevant estimates of tree growth rates as a tool to help ensure the sustainability of indigenous timber production in the Tuawhenua region.
157. The Tūhoe Tuawhenua Trust now has a Sustainable Forest Management Plan ('plan') approved by the Forestry and Land Operations Directorate of the Ministry for Primary Industries. This plan provides for the sustainable harvesting of timber from their 8000ha of steepland tawa-podocarp forest. However, as Trustees point out, the estimates of tree growth rates available for use in this plan were taken from other parts of New Zealand and may not be completely accurate for the steepland tawa-podocarp forests the Trust manages. Tree growth rates vary within species according to region and site conditions. Using the wrong growth rate will result in poor returns or overharvesting. This project will look to directly address this issue.

*It is not good enough to know a lot. We need a deep understanding of our forests.
[Tūhoe Tuawhenua Trust Trustee]*

158. In collaboration with Landcare Research, the Trust is measuring tree growth rates in relation to local forest competition and environment, and calculating more accurate volume growth models. One Trustee commented that production estimates created during this project will also

be shared with other Māori organisations and others with similar steepland forests in the region.

Expanding economic viability for sustainably managed tawa forests

159. As the Trustees observe, the decreasing demand for tawa is undermining the economic viability of tawa harvest, which deters tawa forest owners – many of whom are Māori – from realising the potential of a major forest resource in New Zealand. A second follow-up SFF project (M12-144) therefore aims to build on the initial market scoping that already undertaken for tawa, and more robustly identify opportunities for product and market development. Project documentation highlights how this project aims to engage experts and key stakeholders from the community of interest in a strategy development process to identify ways to increase value and demand for tawa as a forest product. Trustees maintain that through this project Trust members hope to see the implementation of these strategies by a range of participants along the value chain, including local Tuawhenua hapu. Expanding economic viability of tawa harvest in this way will, in the long run Trustees believe, increase the contribution of indigenous forestry to GDP and the revitalisation of communities near tawa forests, many of which are predominantly Māori.

To what extent do these projects demonstrate value for money?

160. Value generated from this SFF investment has social, environmental economic and cultural dimensions. In this final section of the case study, the evaluators reflect on the outcomes within these dimensions.

Social dimensions

161. As the Trustees highlight, this SFF project has helped enable Tuawhenua Trust members and hapu to develop a range of skills and capacities, including: ecological understanding, operational and financial management (timber extraction and milling) planning, and market development. As the project has developed, more people have built their capability in these areas. This work has also contributed to Trust staff building their capacity in project management, proposal development and project administration.
162. The Trustees acknowledge that the development and implementation of these projects have provided a focus to support Tuawhenua Trust members and hapu to think through different forestry models, and identify a holistic and development-oriented approach that aligns with their values. This approach integrates matauranga, links ethics with environmental and economic considerations, acknowledges the desirability of small-scale is desirable – and is people-focused and supportive of local development.
163. While the project is still in a start-up phase, the Trustees point to evidence that knowledge and technologies to address their challenges are

being communicated to the wider community. They acknowledge that their communication and networking has improved over the duration of the project, at both a local and national level. Local communication has been focused around project development and hapu participation. Wider communication and networking has developed from working with MPI staff, neighbours, researchers and contractors to help plan and manage the different projects. Newsletters, reports and the use of popular media (such as Tahi 2011) provide evidence of how project management has helped generate awareness and knowledge sharing at a national level. A television documentary on the Trust's activities in working with researchers and agencies was also developed called "Project Matauranga", and aired on Māori TV. Presentation in journals and at conferences has also spread the learning to an international audience.

164. Both Trustees and MPI Advisers acknowledge how MPI staff have contributed to the project development and have been closely involved in administration. MPI Advisers acknowledge that they have developed a better understanding of the project and local culture. This has provided the basis for project flexibility, based on joint understanding of desired local outcomes.

Cultural dimensions

165. The evaluators saw excellent evidence from this work that when SFF operates in a flexible manner it can better accommodate the needs of Māori. In this project, Trustees acknowledge that the flexibility afforded the project has provided greater opportunities for the Tūhoe Tuawhenua Trust to help its members to work towards their aspirations in ways that reflect and enhance things that are important from a Māori world view. We note evidence of this SFF project cluster supporting Māori agribusiness contribution in all areas – economic, environmental, social and cultural.
166. We note that the project allowed sufficient time for a wide group of people to be engaged in thinking about how resources could be managed in a sustainable way. In this context, the Trustees pointed out that engaging hapu was key to them taking future responsibility for caring for and promoting regeneration of the podocarps. They also highlighted that projects also respected the mana whenua of each hapu (that is, authority over land or territory in a particular area, which is derived through ancestral links to that area).
167. We note that a success of the project is that all involved recognised and supported the need to link the science initiatives with matauranga. As Trustees pointed out, a model for restoring podocarp forests won't work for Māori unless it makes sense for them in their matauranga world. A key to project success we observed is that all project participants realised the importance of ensuring that science was managed in accordance with defined local outcomes, and that this framing was key in setting the research direction.

168. The importance of the Sustainable Farming Fund's role in supporting both innovation and sustainability is clearly evident in these projects. The evaluators found that these SFF projects have encouraged locally driven innovation. As the Trustees reaffirm, without this kind of support it would not have been possible commercially (especially in indigenous forestry with all the regulation) for Ngai Tūhoe to afford to trial different approaches to achieving greater sustainability.

Environmental dimensions

169. The evaluators are cognisant of the long timescale for this project as Tūhoe try to build an environmental base that recognises their desire to regenerate their podocarp forests. This means that the initiative needs to be managed in terms of the 500-year plus timescale required for podocarp regeneration. While there are few models around to help them, we note that with the support of the SFF projects the Trust has developed a model that supports their aim of getting forests back into good order. This longer-term vision inevitably slows down the achievement of some of their economic short-term benefits for longer-term gain.
170. We note there is good progress on the environmental dimensions – for instance a holistic and natural approach to the utilisation and restoration of Trust lands has been developed, and implementation has started.
171. According to the Trustees, the principles of this model acknowledge that for Māori matauranga (knowledge), both traditional and scientific, must form the foundation of a forest development approach. We can see that the project provided an immediate benefit of developing operational research that builds on science. This ensured that researchers and end users could both see what that research meant in practice and what it could do. In this way better environmental standards can be incorporated in the way Tūhoe Tuawhenua lands are managed. Moreover, as Trustees remind us, greater use of environmentally sustainable practice is still being investigated amongst this community. Tūhoe Tuawhenua Trust members are aware they will be able to leverage off environmental credentials to respond to market opportunities and believe that its indigenous origin will be a key selling point of the brand.

Economic dimensions

172. The Trust seeks a future for Tuawhenua lands where the people and the lands are in harmony and thriving. It seeks to restore podocarp while creating economic opportunities for Ruatāhuna people. This SFF project has yet to show an economic return. Nevertheless, we believe that the research has identified a way forward that may over time demonstrate the economic potential associated with developing the market for indigenous timbers. In the Tūhoe context such economic returns, if realised, could contribute to future local economic potential through increased self-sufficiency and reduced utilisation of state assistance.
173. The final report from the Podocarp Restoration study (SFF 08/060) estimated that in order to be viable, at least 20m³ log volume of tawa

would need to be extracted per week, from which at least 8m³ of green-sawn timber would need to be produced and sold at an average price of at least \$1,100 per m³. These figures imply minimum viable annual turnover of around \$450,000 (or \$3.8 million over 15 years).

174. In comparison, the SFF projects were completed at a cost of \$344,510 including \$305,450 from the SFF and \$39,060 of other funding (around 9% of the minimum potential 15-year turnover from tawa logging).
175. The report notes that the market for tawa would need to be redeveloped as New Zealand tawa (and beech) have been substituted out by American Oak over recent decades. Another SFF project noted that southern beech timbers could approach a \$25 million timber industry if they substituted imported timbers of equivalent properties.

Acknowledgements and References

References

176. This case study narrative and value for money assessment has been compiled using a range of literature.
177. SFF proposals and reports for the following projects:
 - 08/060: Podocarp restoration on Tuawhenua lands
 - M2-144: Ensuring sustainable productivity of steepland tawa-podocarp forests
 - M2-145: Expanding economic viability for sustainability managed Tawa forests.

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178. We would like to thank all those we interviewed in the development of this case study. These comprised four Tūhoe Tuawhenua Trust trustees, a Trust staff member, two MPI advisers and an MPI policy manager. Their comments, enthusiasm and contributions to the development of this case study were invaluable and much appreciated.
179. The lead researcher for this case study was Dr Will Allen, with support from Julian King and Judy Oakden.

5 Methodology

180. These three case studies were developed to provide additional depth and breadth of outcome evidence to support the evaluation of the Sustainable Farming Fund (SFF). In order to help determine the value of SFF outcomes, the case studies were developed as performance stories. They were designed to provide sufficient depth and to explore the extent to which projects can build on each other, and the ways in which (for these clusters) SFF was worth the investment.
7. The development of the performance stories has drawn heavily on the SFF project reports and other project literature provided by grantees. The framing and lessons that emerge through these stories were guided by related interviews with key project staff and stakeholders. The stories that emerge from the literature and related interviews were designed to show how cumulative impacts from a number of related SFF projects can develop over time, with later projects building on learnings from those conducted earlier.
181. We drew on the expertise of Ministry for Primary Industries (MPI) staff with considerable experience of SFF to select the cases. These were selected as providing a good, representative sample of the breadth and variety of SFF projects (Table 1). They aimed to be able to highlight cumulative impacts that had developed within, and across projects. They represent a range of projects - across different types of production, regions, SFF staff and the 12-year timeframe of the SFF portfolio, types/sizes of SFF funding; and they included a project that benefited Māori.

Table 3: Rationale for choice of cases for performance stories

Case	Rationale
Industry: Viticulture Sustainability	<ul style="list-style-type: none"> This case illustrates strengthening quality and production. There have been many projects over the past 10 years in this industry. There are multiple outcomes in economic and environmental terms and good examples of industry development and expanding markets and this is an example of project that has national coverage. A total of 12 projects were included.
Catchment: Top of the South Water Quality	<ul style="list-style-type: none"> This case illustrated enabling ongoing production. This project demonstrated regional coverage There were three main projects which clustered for this case.
Local development: Tūhoe Forestry	<ul style="list-style-type: none"> This case illustrated growing new production This project demonstrated supporting a community capability and capacity building There was one main project for this case, plus two projects that were funded from the 2012 funding round (still in progress).

182. The following steps occurred in developing the performance stories:
- Cases confirmed with MPI.

- Key useful documentation in the files identified for incorporation into these stories.
 - Reviewed the documents and determined the additional information needed from each cluster by way of interview.
183. Interview tools and data analysis templates built on the outcomes framework and rubrics from the main evaluation. Different topic guides were developed for the different cases. The topic guides that broadly covered the following areas are shown in the following table.

Table 4: Outline of topic guides

Area	Examples of questions
Context	<ul style="list-style-type: none"> • Who was involved? Why? What was the situation at the start of this cluster of projects that needed to be solved? • The long-term change the initiatives sought to support, and who was intended to benefit? To what extent was this intended to benefit Māori?
Activities, Outputs Outcomes	<ul style="list-style-type: none"> • The sequence of events that occurred – what happened, who was involved? • What did you expect to happen and what actually happened? • How might that be explained?
Reflection	<ul style="list-style-type: none"> • What were the barriers and enablers to this cluster of projects? • What unanticipated effects have there been – what went right and what went wrong? Explore some of the more disappointing outcomes and what they learned from that. • Going forward, how sustainable is the work arising from this project? • How might this initiative be scaled up and out?
Questions of value and worth	<ul style="list-style-type: none"> • To what extent was this cluster of projects worth implementing? • What is different now compared with at the start? • What have been the most valuable outcomes to stakeholders? How can we prove this? • How does the cluster create economic value? (i.e., what are the productivity, sustainability, growth in production, growth in exports or other outcomes that represent an economic return to individuals, the sector, and the NZ economy?) • What do these economic gains look like in context (or how might we place them in context) – e.g., as a percentage of estimated market size, opportunity cost of pre-existing inefficiencies in the sector, etc • If SFF did not exist, what would we lose (with explanation that this is not the focus of the evaluation)

184. For each cluster of projects a performance story was developed. This was then sent back to interviewees for checking. The evaluators then developed the value for money section to draw out the lessons learned across the social, economic, environmental and (where applicable) cultural dimensions. This final story was then sent back for review by the industry and project interviewees.
185. All case study interviews were undertaken by Dr Will Allen between 20 May 2013 and 15 October 2013.