

Sustainable Land Management and Climate Change

A Review of 10 Years of Research

Summary of findings



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Sustainable Land Management and Climate Change: A Review of
10 years of Research Summary of Findings

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A Review of 10 Years of Research

The Sustainable Land Management and Climate Change (SLMACC) research programme was established in 2007, and is administered by the Ministry for Primary Industries (MPI).

Sustainable Land Management and Climate Change—SLMACC

SLMACC aims to contribute to the achievement of New Zealand's climate change targets, through research to mitigate greenhouse gas emissions and understand the impacts of climate change. This will thereby improve risk management and increase the resilience of the primary sector to climate change.

Critical Issues that led to SLMACC in 2007:

- Need to meet international Greenhouse Gas (GHG) reduction goals
- Need to maintain profitable and sustainable agricultural and forestry sectors
- Lack of understanding of the impacts, implications and adaptations of climate change
- Lack of mechanisms for response to climate change, for policy and the public

Aspirational outcomes expected from SLMACC:

- Increased capacity and capability to address climate change in NZ
- Increased knowledge about climate change
- Increased number and implementation of mitigation and adaptation options
- Increased accountability and acceptance of climate change from the primary industries
- Use of SLMACC research as evidence basis for policies, and business leadership

In 2016 MPI commissioned reviews of the topic areas under the SLMACC programme, using an external tender process. This document presents the outcomes of these reviews:

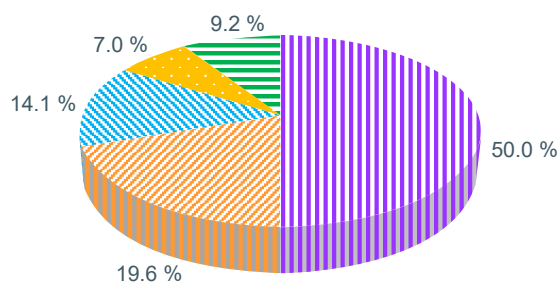
- Mitigation
- Forestry
- Adaptation
- Technology Transfer

Methods used by the independent reviewers included interviews and surveys of SLMACC project leaders and stakeholders, and a review of resources created under SLMACC.

SLMACC Investment 2007-2017

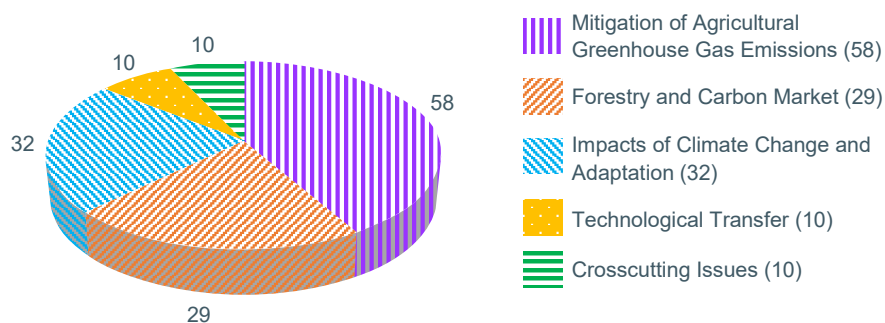
Total MPI Investment (\$M)
\$50

Percentage spent in each area



Number of projects
139

Number of projects in each area



Value for Money

The Train the Trainer project delivered workshops to NZ rural professionals on climate change and how farmers and growers can adapt their business to improve profitability under future climates.

The workshops were attended by 398 rural professionals (19% of NZ rural professionals).

The return on the \$0.45 million project was estimated to be \$4.9 million from improved future profitability of sheep, beef, dairy and orchardists under climate change.

Burggraaf et al. (2017) "Cost-benefit analysis of two projects funded under the SLMACC Technology Transfer Scheme". Report to MPI as part of Technology Transfer Review.





Summary

The reviews addressed four key evaluation questions:

1. To what extent have the desired outcomes been achieved from the SLMACC projects?

SLMACC projects have been effective at creating high quality research, engaging with stakeholders¹ and end-users², and growing science capacity to research climate change in New Zealand. They have also been effective at creating usable research, which has met science needs and has been appropriate for the target audience.

Areas for improvement of SLMACC projects include the need to shift from a focus on basic research to more applied research. This includes creating research that is accessible to a wide range of audiences, and is able to provide immediate practical adaptation and mitigation options. SLMACC projects also need to ensure they are able to measure the impacts of their research.

Key aspects of performance achieved from 10 years of research

Criteria	Mitigation	Adaption	Forestry	Technology Transfer
Build Science Capacity	Moderate	High	High	Low
Influence on Science	High	Moderate	High	Moderate
Engagement and Networks	Low	Moderate	Moderate	Moderate
Knowledge exchange	Moderate	Moderate	Moderate	Moderate
Usability of research	Moderate	Moderate	Moderate	High
Influence and Impact	Moderate	Moderate	Moderate	Insufficient Evidence

¹ Stakeholders include those from the private sector, government (local and central), industry bodies and research institutes

² End-users are the stakeholders who will be the direct users for whom the research or technology is ultimately intended.

“MPI’s investment in SLMACC means that New Zealand is in a better position in terms of having the knowledge and understanding that informs NZ’s global contribution and domestic targets. It is very unusual in that the evidence base development has preceded the policy response.”

- Stakeholder Survey

2. What do we still need to know?

We need to better understand farmer, grower and forester needs, rather than focusing on government objectives at the time. This includes awareness, attitudes toward adopting adaptation and mitigation options, and knowledge, skill and infrastructure needs.

3. What is holding back uptake of SLMACC findings?

To date, SLMACC projects have largely focused on building knowledge. Farmers, growers, foresters and rural decision-makers now need this knowledge translated into real on-farm options for implementation. This is about bridging the difference between ‘what we know’ and ‘how do we address it.’

4. Recommended key next steps

- Undertake research to better understand knowledge use and decision-making regarding climate change in New Zealand. This will help to increase understanding of how mitigation and adaptation options become implemented.
- Undertake research into farmer needs, to ensure future research addresses key gaps.
- Develop sector specific adaptation and mitigation options for on-farm use (which need to be realistic, affordable and effective).
- Integrate monitoring and evaluation in SLMACC projects from the beginning, and involve key stakeholders in this process. This will allow measurement of the extent to which projects have achieved their intended outcomes and impacts.

Key Findings

Mitigation

Purpose

To develop practical options for reducing greenhouse gas emissions from agriculture and creating options for managing emissions.

Strengths

1. Influence on Science

Mitigation research has positioned New Zealand as a world leader of pastoral agricultural GHG mitigation research. Co-benefits of developing mitigation strategies include improved water quality, international collaborations and providing data for New Zealand's low carbon footprint.

2. Usability of research for next users

Next-users consistently rated SLMACC projects as being well-aligned with their interests

**Stakeholders rated
the relevance of
SLMACC mitigation
research as
7.5 out of 10**

3. Led to future research funding

Initiated research in specific areas, has led to further research funded by New Zealand Agricultural Greenhouse Gas Research Centre and Pastoral Greenhouse Gas Research Consortium.

Time to address farmers' needs

Projects were aligned with governmental objectives at the time but have not aligned as well with farmers and grower needs.

"A lot of our farmers have been concentrating on water quality... because there are rules going to be in place [for water], so climate change has been seen as something a little bit further down the track."

- Stakeholder Survey

Opportunities to do even better

1. Early engagement with farmers and industry bodies to improve communication with and extension to farmers.
2. Bring together researchers and end users to identify existing mitigation knowledge that can be packaged and disseminated to farmers, growers and foresters.

Adaptation

Purpose

To understand the potential impacts and implications of climate change and identify adaptation strategies to enhance resilience to climate change for New Zealand's primary industries.

"SLMACC really filled an important gap when more funding was needed"

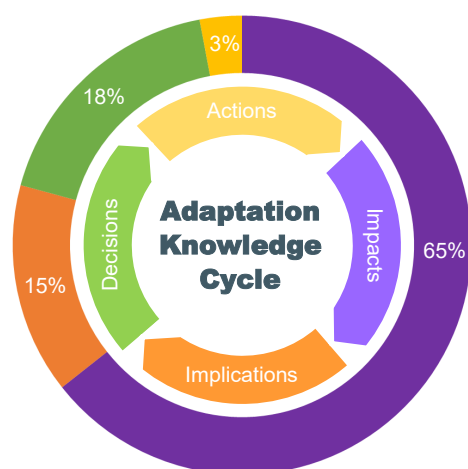
- Stakeholder Survey

Strengths

1. Enhanced science understanding
Adaptation research has established essential understanding of the potential impacts and implications of climate change for a range of primary industries, particularly for pastoral farming systems responding to drought.
2. Built science capacity
SLMACC has provided a critical source of adaptation research funding which has helped build New Zealand adaptation research capability and capacity, e.g. by supporting early-career researchers, and international collaborations.

Opportunities to do even better

1. Prioritise more place-based and sector specific research adaptation impacts and implications (especially viticulture and horticulture), as well as cross-cutting research.
2. Support research to enhance strategic climate change adaptation decision-making and action in the primary sector.



SLMACC adaptation research and the knowledge cycle

The majority of SLMACC research reviewed has focussed on understanding the impacts and implications of climate change (65%, and 15% respectively).

To maintain profitability in the primary sector, an increased focus on adaptation is urgently needed. In particular on the range of options available, industry strategies and priorities, and on-the-ground decision-making processes.

Key Findings

Forestry

Purpose

To understand the risks of climate change on New Zealand's forestry sector and develop strategies for adapting to climate change and mitigating greenhouse gas emissions.

Strengths

The SLMACC research has:

1. Developed more accurate knowledge about long-term carbon storage in forests, which supports the ETS and NZ's Paris Agreement commitments.
2. Increased the forestry sector's understanding of climate change risks to their business, leading to targeted practice change.
3. Engaged international communities and local end users on developing carbon accounting systems.
4. Maintained science capability in climate change research.

Opportunities to do even better

1. Engage with end users and community in the design and extension of research, to maximise research impact.
2. Take more of a catchment, cross-disciplinary and impact focussed approach to help forestry owners and communities, including Māori, make evidence-informed decisions on climate change impacts, e.g., "plant the right trees in the right place... under the right climate conditions."
3. Increase research investment to build capability and allow additional research on adaptation and indigenous forests; and partnering with Māori.



Technology Transfer

Purpose

To provide farmers and growers with resources to increase awareness of climate change, assess associated risks, and provide practical on-farm options. Also train rural professionals who can relay knowledge to farmers and growers.

Strengths

1. Use of science and professional expertise

“[The presenters], who are also members of the resource group, have proven to be invaluable experts and facilitators all in one. They were able to bring sound technical insight to the discussion and provide a well-grounded practical session.” – Beef + Lamb NZ

2. Strategic marketing and presentation of resources and events

“Early in the piece, it was decided by the project team that a positive approach would be a focus on resilience, rather than climate change, so the project was branded: “Resilient Cropping” – Mathers & Bloomer, 2013

3. Fit-for-purpose resources

- 91% of stakeholders who were aware of the “Over the Fence” Handbook had also used the resource
- Stakeholders rated the handbook as 5.8 out of 7 for usefulness

Opportunities to do even better

1. Farmers want and need immediate take-home options.

Farmers and growers want practical, realistic and immediate take-home options for their farm, orchard or crop, focusing on:

- Affordability (time, money)
- Acceptability (social licence)
- Availability (must be timely)
- Practicalities (existing infrastructure)
- Convenience (ease to implement)

2. There is an urgent need to know how we are doing

Urgent need to embed monitoring and evaluation in the SLMACC fund, to learn from projects, ensure progress toward SLMACC outcomes, and evidence SLMACC outcomes and impacts.

3. Co-design with industry and farmers

It is important to involve representatives from the intended audience in the design and delivery of technology transfer to ensure better uptake.



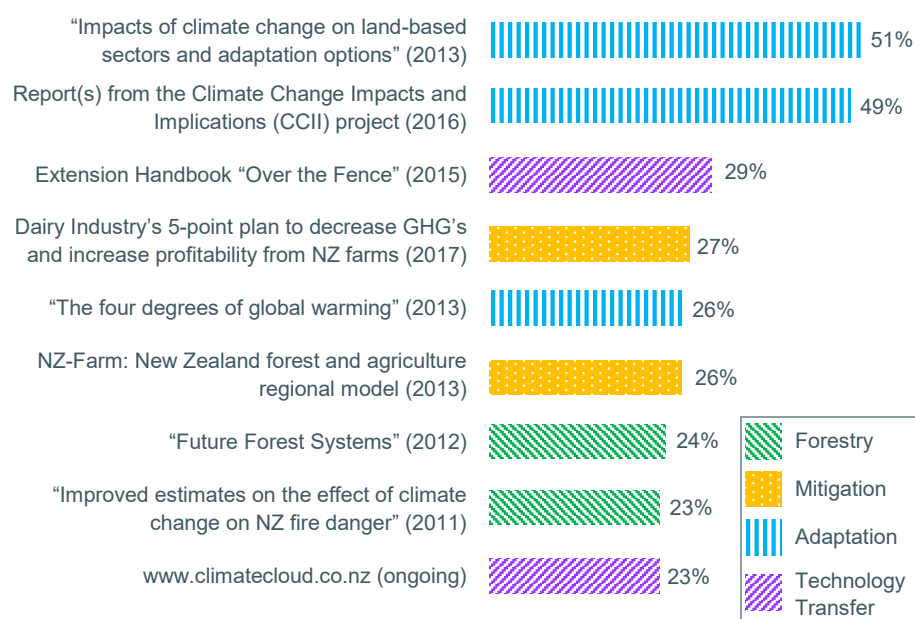
Project Leader and Stakeholder Survey Results

As part of the review, 148 stakeholders were surveyed.

- 58% of stakeholders were aware of SLMACC programme.
- 42% of stakeholders have used or read SLMACC research through the Climate Cloud Website.
- 21% of stakeholders used SLMACC research for a specific purpose, such as to increase knowledge or inform policy or research.

Stakeholder awareness of SLMACC resources

When looking at key reports published in each area, stakeholder awareness was highest for adaptation related resources.



Stakeholder use of SLMACC research

SLMACC research is being used to increase stakeholder knowledge and inform research, and to a lesser extent to support direct action or plan for the future.



Stakeholders identified the need to gain more exposure for SLMACC research:

“All SLMACC research needs to be well socialised.”
- Stakeholder Survey

“I would love to be exposed to more research surrounding climate change, it does not seem to be getting out there as well as it could or should be.”
- Stakeholder Survey

Stakeholders identified key barriers to achieving this including a lack of effective science communication, and information overload:

“I hope that more work is done to communicate the findings of this research with industry.”
- Stakeholder Survey

“There is a wealth of [information] and it is excellent, but I suspect for many ‘non-scientists’ [it is] quite overwhelming.”
- Stakeholder Survey

Overall, SLMACC research is rated by stakeholders as useful, relevant and good quality.

“SLMACC is my absolute favourite research fund. The findings from SLMACC inspired me to move to New Zealand and I tend to find that whatever NZ climate change mitigation/adaption research I find online (that is actually useful) is connected to some SLMACC research programme or another. I think there needs to be a lot better management of previous work and results and better coordination between old and new work. Last but not least, please continue the focus on social science work.”

- Stakeholder Survey

Overall Recommendations

The reviewers suggested that MPI (as SLMACC Administrator) consider the following independent reviewers key recommendations to increase the impact of SLMACC:

1. SLMACC research projects need to increase engagement with relevant stakeholders, including farmers and industry. This will work to ensure resources are fit-for-purpose, and improve extension¹.
2. SLMACC research needs to shift focus from knowledge production and a focus on impacts, to delivering actionable climate change mitigation and adaptation options for the primary industries.
3. SLMACC research projects need to embed monitoring and evaluation, to enable measurement of progress toward desired outcomes and impacts.

¹ Technology transfer (sometimes called extension) is defined as the creation, application and subsequent supply of knowledge and technology to next and/or end-users.

For more information please contact Janine Alfeld at MPI, Janine.Alfeld@mpi.govt.nz, or refer to the full review reports which are available at www.climatecloud.co.nz or www.mpi.govt.nz:

Technology Transfer

Payne, P., Turner, J. & Percy, H. (2018). A Review of the SLMACC Technology Transfer Fund. AgResearch Ltd: Hamilton.

Adaptation

Craddock-Henry, N., Flood, S., Buelow, F., Blackett, P. & Wreford, A. (2018) Map the gaps: Synthesis and systematic review of climate change adaptation in New Zealand's primary industries. Manaaki Whenua: Lincoln.

Mitigation

van der Weerden, T., Jonker, A., Fleming, D., Preston, K., de Klein, C. & Pacheco, D. (2018) A Review of SLMACC agricultural greenhouse gas mitigation projects. AgResearch Ltd and Motu Economic and Public Policy Research.

Forestry

Dunningham, A., Grant, A. & Wreford, A. (2018) A review of climate change research in New Zealand focusing on forestry. Scion Research: Rotorua

SLMACC Stakeholder and Project Leader Survey

Payne, P., Chen, L., Turner, J. & Percy, H. (2018) SLMACC Review: Survey of Project Leaders and Stakeholders. AgResearch Ltd: Hamilton

“SLMACC has been instrumental in allowing me to develop a research career focused on pressing issues facing rural New Zealand.”

Stakeholder Survey



