



Sustainable Land Management and Climate Change Review

Agricultural GHG mitigation

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The Sustainable Land Management and Climate Change (SLMACC) Plan of Action was created in 2007 by the then Ministry for Agriculture and Forestry (currently known as Ministry for Primary Industries or MPI). The Act included the creation of the SLMACC funding programme. Over the past 11 years, the fund has invested more than \$25 million into research addressing agricultural greenhouse gas (GHG) mitigation.

Objective

This review¹ aims to evaluate the impact of the SLMACC agricultural GHG mitigation research programme in relation to developing options for reducing enteric methane (CH₄) and nitrous oxide (N₂O) emissions. The review assessed more than 30 projects, mapped into five different mitigation clusters: Recommendations for improvements to the SLMACC fund for agricultural GHG mitigation are included.

- CH₄ inhibitors/vaccines,
- low GHG animals,
- low GHG feeds,
- reduced N₂O from soil/plants, and
- management interventions.

Evaluation method

An evaluative criteria rubric was used for gauging the effectiveness of the research programme - this enabled a qualitative assessment of key measurement criteria. The criteria included in the evaluation are shown in Table 1.

For the agricultural GHG mitigation review the rubric was populated with data collected from different sources, including project outputs (reports and scientific publications), and surveys and interviews of researchers.

Table 1: Evaluative criteria rubric scores for agricultural GHG mitigation.

Evaluative criteria	Average rubric outcome across clusters
Science capacity and capability enhancement	Moderate
Influence on science	High
Engagement and networks	Low
Learning, awareness and knowledge exchange among next users, farmers and industry	Moderate
Usability of research for next users, farmers and industry	Moderate
Influence on stakeholders and impact for NZ	Moderate

Results and interpretation

The **moderate impact on science capacity and capability** is reflected in the number of scientific publications produced from SLMACC-funded projects relative to the total number of publications generated in NZ, and the development of early career scientists, particularly in the area of low GHG feeds.

The **high influence on science** is illustrated by the international positioning of NZ organisations addressing research into GHG mitigation².

There was **low engagement and networking** with stakeholders, partly because projects did not have a strong focus on transfer of knowledge to end-users. The low score may also be a reflection of the fact that GHG mitigation was not a 'front of mind' issue for farmers and industry between 2007 and 2016.

Learning, awareness and knowledge exchange was **moderate**, partly because the research activities were often in a specific area leading to knowledge exchange being used for follow-up research activities. However, there was generally little extension to the general public and farmers/industry, as most projects did not have this as an objective.

Usability of research for next users, farmers and industry was **moderate**. Projects aligned well with next users (researchers and stakeholders) by funding new research areas or supporting the development of 'proof of concept' projects. However, development of practical answers to real problems did not align well with farmers' issues/concerns/demands, primarily because projects were aligned with government rather than farmer/industry objectives at the time of procurement.

The **influence on stakeholders and impact for NZ** was **moderate**. Many of the mitigation options are still at the discovery stage of research, while others close to market have had little uptake. This is mainly due to lack of information and financial incentives for mitigating GHG. However, co-benefits of GHG mitigation are better understood (e.g. improved water quality, international collaboration).

Recommendations

To maximise the future value and usefulness of SLMACC funded research, we recommend the following:

- Ensure the SLMACC programme on agricultural GHG mitigation includes engagement with targeted next users, farmers, and industry bodies. This will assist in targeting potential practical mitigation options and improving communication and extension. To achieve this, it is recommended that extension activities are co-developed and co-funded by farmer extension organisations such as DairyNZ and Beef and Lamb NZ.
- Ensure that the SLMACC programme includes resources for a coordinated communication plan to report key findings to future users and the wider public, including the use of current communication/extension

mechanisms such as the Climate Cloud (www.climatecloud.co.nz).

- Commission a project with researchers, policy agents, change agents and involved practitioners to identify practical information for dissemination. Future funding should then be prioritised for extension activities that support uptake of available options and for research on identified gaps in agricultural GHG mitigation research.
- Use findings of the SLMACC programme to inform industry initiatives to address GHG mitigation issues (e.g. Dairy Action for CC).

Overall, the SLMACC agricultural GHG mitigation programme was evaluated, on average, as meeting its objectives to a moderate extent. While it has been successful at influencing science, the programme could be further improved by combining mitigation activities with effective extension activities co-developed with farmers and industry.

References

¹ van der Weerden, T.J, Jonker, A., Fleming, D.A., Preston, K., de Klein, C.A.M., Pacheco, D. 2018. A review of SLMACC agricultural greenhouse gas mitigation projects. Invermay: AgResearch Ltd.

² Fleming, D.A., Preston, K. 2018. International Agricultural Mitigation Research and the Value and Impacts of two SLMACC Research Projects. Wellington: Motu Economic and Public Policy Research.

Acknowledgements and further information

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