DOES MONEY GROW ON TREES? CLIMATE MITIGATION IN THE SHEEP-BEEF SECTOR

An Executive Summary

Levente Timar
Motu Economic and Public Policy Research
levente.timar@motu.org.nz

Ruminating on
Methane. Land use will change and
Someone's gotta pay.

INTRODUCTION

Methane and nitrous oxide emissions make up about half of New Zealand's overall greenhouse gas emissions. Most of these emissions come from ruminant livestock agriculture. Around a third of the country's land area is devoted to sheep-beef farming, and much of this pastoral land could be suitable for reforestation.

This country's unique emissions profile has lead New Zealand policymakers to consider extending climate change policy to cover emissions from pastoral agriculture. Internalising the cost of those emissions and the mitigation that is likely to occur as New Zealand moves toward a lower net emissions rural sector will have significant effects on farmers, farm owners and rural communities.

This paper looks at how sheep-beef farms around New Zealand may change the way they use land in response to climate policy and finds smaller impacts than previously thought.

METHOD

The researcher uses simulations from the Land Use in Rural New Zealand model to see how farmers could respond to carbon prices by abandoning previously grazed pasture or by establishing plantation forests on marginal land. No major mitigation option, other than land-use change has been identified for sheep-beef land. The researcher develops a simple framework to calculate the extent to which rewards (carbon credits for new plantation forests) could be used to offset emissions liabilities. This involves converting the credits a farmer would be able to sell with certainty (without taking a carbon price risk) to an indefinite annual flow of income. The researcher then considers the likely impact on profits. The analysis is carried out at the level of representative farm classes that differ systematically in their land-use intensity, profitability and suitability for forestry.

The analysis takes 2012 land use as a base and then follows two different paths to 2030 – one 'business as usual' with no climate policy and the other under a policy where emissions cost $25 per tonne CO2-equivalent and there is no free allocation of allowances. These are the maximum expected impacts. Given the observed land use in 2012, the average impact of this policy would be around 11% loss of profit for dairy farmers and 17% loss of profit for sheep-beef famers.

This research was funded by the Sustainable Land Management & Climate Change and Climate Change Impacts and Implications research programmes. The authors gratefully acknowledge this assistance.
© 2016 Motu Economic and Public Policy Research Trust and the authors.

RESULTS

Intensive farm classes mitigate little. Farmers in these classes tend to bear the costs of emissions because the opportunity cost of exiting pastoral agriculture would be high – in fact, on high quality land, the policy may generate further conversions to dairy. The dominant land-use response in more extensive systems is land abandonment or afforestation, but opportunities for afforestation are not evenly distributed.

Relative to average profits, lower profitability systems tend to face higher liabilities both before and after the land-use response. Farmers in less intensive North Island farm classes may benefit most from carbon rewards. Results suggest that income from rewards could on average offset as much as half of emission liabilities on North Island hill country farms.

Figure 1: Average profits and the relative impact of the policy in 2030 by sheep-beef farm class

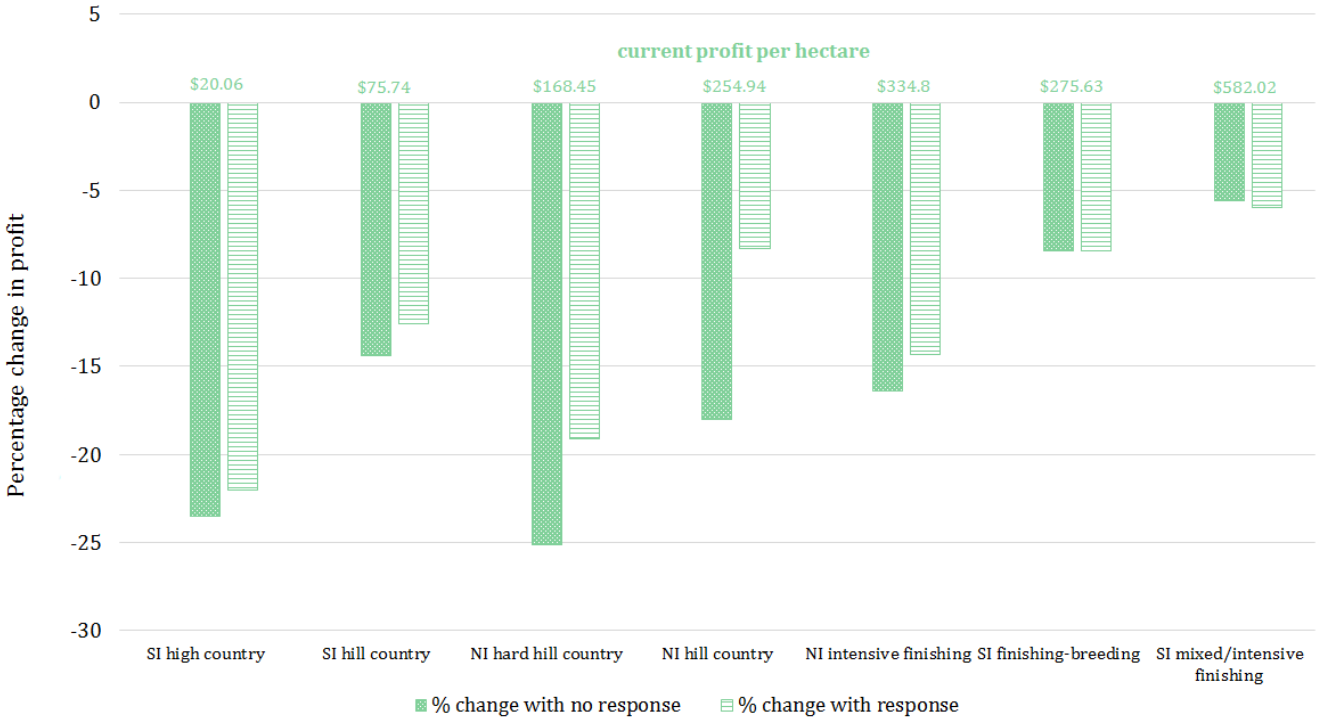

IMAGE BY Philip Capper CC BY 2.0

Complementary policies to assist with community transition are also important. A key factor for farmers is whether (and how) allowances are allocated. The potential transfer of wealth through allocation is large, and farms that can also take advantage of opportunities presented by carbon credits could actually benefit from the policy with free allocation tied to historical emissions. This would be most likely on North Island hill country areas, where forestry is already an important part of the local economy.

INTERNATIONAL RESPONSE

The analysis identifies some plausible differences in the impact of climate policy across regions and sheep-beef farm types in New Zealand. If the international community does not act on agricultural emissions as strongly as New Zealand does, farmers here will likely lose because they are largely price takers in international markets. With strong international policy, the liabilities faced by farmers would be at least partially offset by higher commodity prices.

While the overall impact of climate policy ultimately depends on international action, the variety in sheep-beef farmers' response to carbon pricing remains. The patterns of impact identified in this paper are therefore expected to hold for the majority of international actions.

READ THE FULL VERSION OF THE WORKING PAPER AT

WWW.MOTU.ORG.NZ OR CALL US ON 04 939 4250

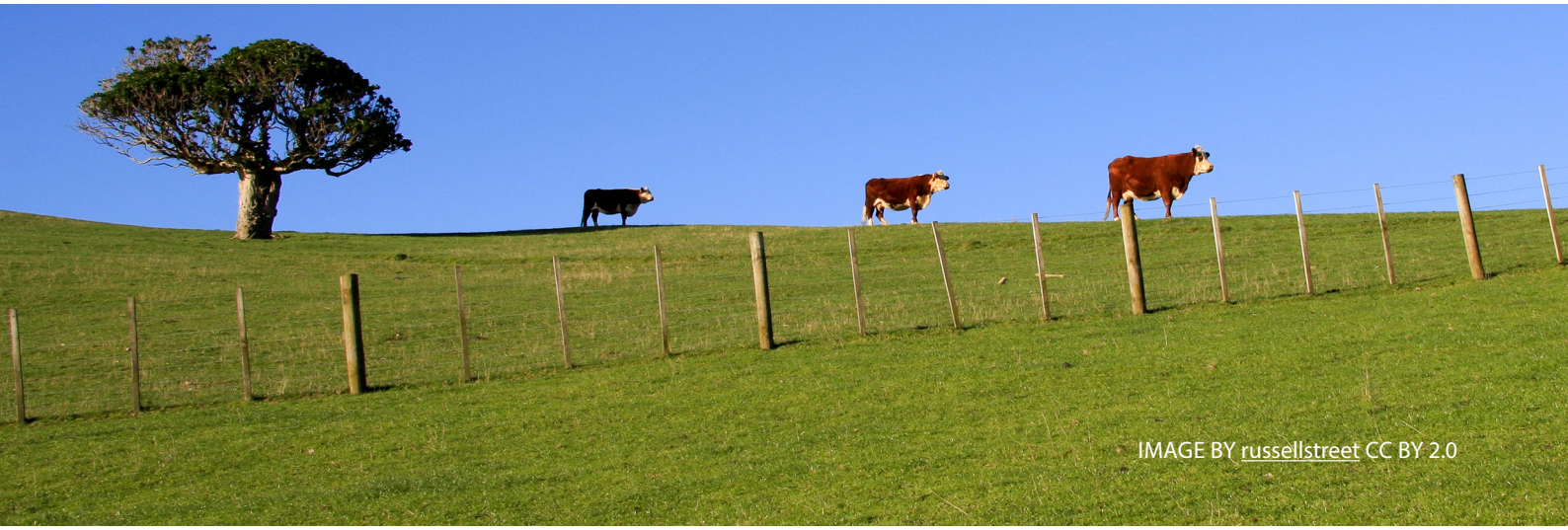

IMAGE BY russellstreet CC BY 2.0

Motu Economic and Public Policy Research is an independent research institute operating as a charitable trust. It is the top-ranked economics organisation in New Zealand and in the top ten global economic think tanks, according to the Research Papers in Economics (RePEc) website, which ranks all economists and economic research organisations in the world based on the quantity and quality of their research publications.