

Managing for Change in Hawke’s Bay, New Zealand: Farmer Adoption of Practices

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Issue

This brief discusses management practices that farmers in Hawke’s Bay, New Zealand have already adopted and are most likely to adopt in the future that provide benefits for climate adaptation and greenhouse gas (GHG) mitigation. Agriculture may experience significant impacts from changes in water availability, temperatures and extreme events. Simultaneously, agriculture plays an important role in helping to reduce GHG emissions and improve environmental sustainability through energy and electricity reductions, modified agricultural practices, and carbon sequestration associated with crop and grassland management. Farmers have a suite of practices that may assist them in adapting to these changes and supporting the sustainability of their farming enterprises. However, little is known about farmers’ likelihood to change practices in the future and what may influence these decisions. It is crucial to understand the types of practices farmers are most interested in implementing as New Zealand continues to develop climate and environmental policy.

Key Findings

- Up to 39% of farmers have already implemented practices to reduce GHG emissions and adapt to climate change.
- The most adopted adaptation practices: Among all farmers water monitoring techniques (24%); among horticulture (hort), viticulture (vit) and cropping farmers implementing frost protection (36%), and among animal producers shifting to trading stock schemes (31%).

- The most implemented mitigation strategies include: Among all farmers planting trees (31%) and reducing nitrogen fertilizer use (31%); among hort, vit and cropping farmers burning of crop residues (39%); and among animal producers reducing stocking rates (11%).
- The most likely mitigation practices to be adopted include installing solar panels or wind turbines, energy efficiency and reduced inputs, conservation tillage and reducing stocking rates.
- The most likely adaptation practices are reducing stocking rates, adopting new crops and building water storage facilities.
- Cost and farm productivity are the most important considerations for farmers adopting new practices or technologies.

Policy Implications

As New Zealand considers implementation of the emissions trading scheme and strategies for agricultural climate change adaptation it is important to understand the types of practices that farmers are most likely to implement. At the same time, it is necessary to baseline the kinds of mitigation and adaptation practices that have already been implemented. This data suggest that up to 40% of farmers have already implemented several practices including reduced crop residue burning, frost protection, stock trading schemes and tree plantings. At the same time, many animal strategies that can offer sizeable reductions in GHG emissions have yet to be largely adopted. Ultimately, this data can assist policymakers in developing strategies that maximize the possibility of increasing the uptake of climate change mitigation and adaptation practices.

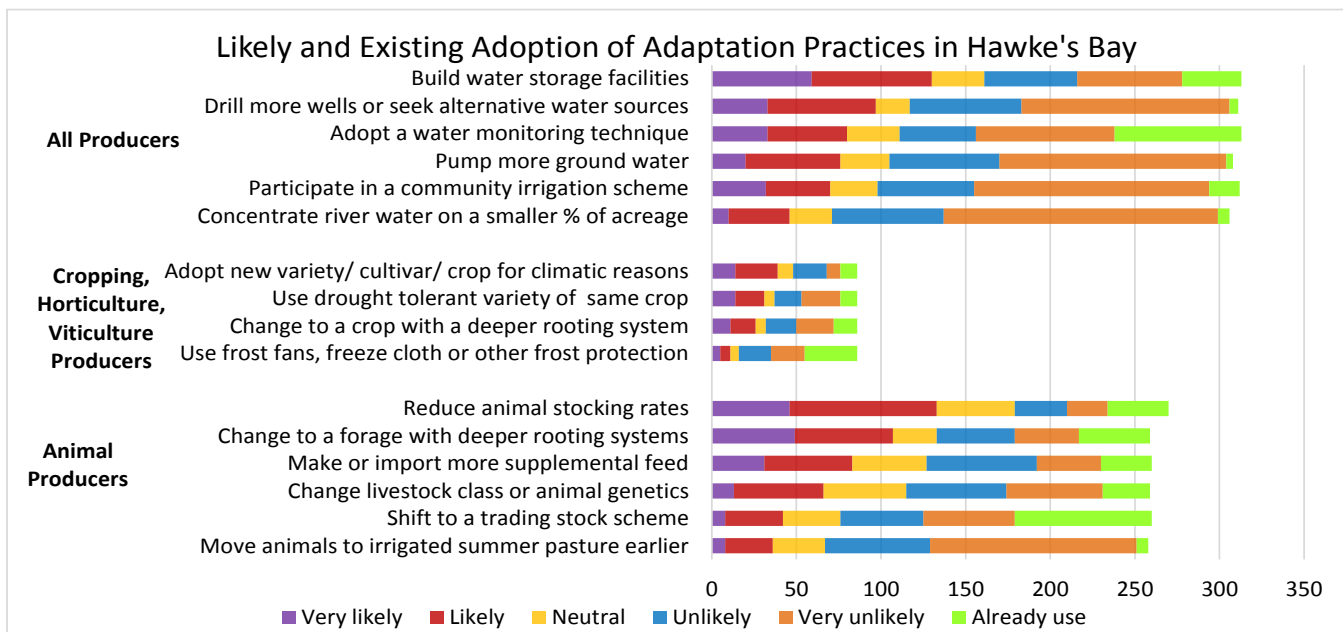


Figure 1. Likelihood of farmers to adopt climate-related adaptation practices in Hawke’s Bay in the future. Light green bars indicates the number of farmers who have already adopted this practice. The number of farmers is related to the category listed on the left.

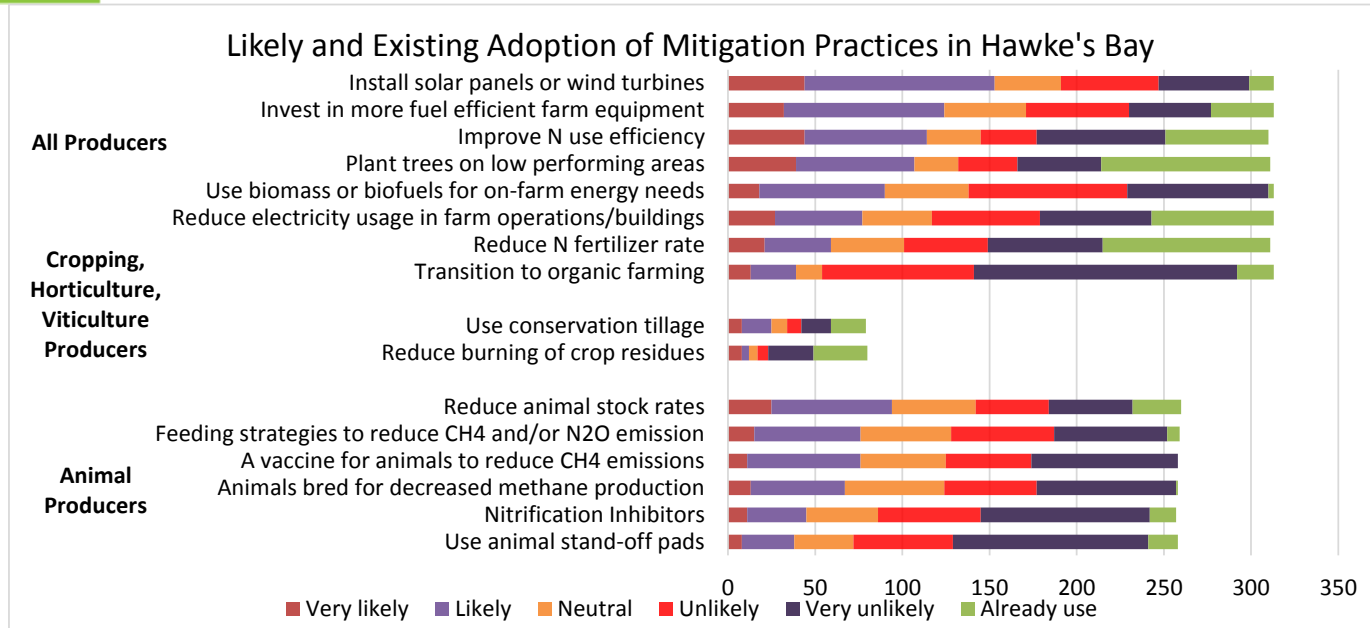


Figure 2. Likelihood of farmers to adopt practices to reduce greenhouse gases in Hawkes Bay in the future. Light green bars indicate the number of farmers who have already adopted this practice. The number of farmers is related to the category listed on the left.

Methodology

Interviews with 8 agricultural industry scientists/representatives and policymakers and 6 farmers in Hawkes Bay were conducted in July 2012 to understand farmers' and agricultural industry climate change perspectives, management strategies, and potential for adopting new practices in the future. A regional telephone survey was conducted in August-October 2012 with a total of 313 responses (41% cooperation rate). Among the respondents 84% were male, 77% were full-time farmers and 6% were certified organic. Survey questions asked about farm characteristics, management strategies, existing practices, climate change perspectives, government perspectives, and future adoption of mitigation and adaptation practices. The survey was also conducted in Marlborough, New Zealand.

Detailed Results

Figure 1 shows the most likely adaptation practices to be implemented by non-adopters including (among their categories) building water storage facilities (47%), adopting new crops (51%) and

reducing animal stocking rates (57%). For practices already implemented, adopting a water monitoring technique, using frost protection, and shifting to a trading stock scheme are the most adopted among specific farmer sub-categories. Figure 2 shows the most likely mitigation practices among non-adopters (in their category) installing solar panels or wind turbines (51%), planting trees (50%), conservation tillage (42%), and reducing animal stocking rates (41%). Reducing crop residue burning, planting trees, and reducing fertilizer rate were the most adopted existing mitigation strategies. It's important to note that the adoption of these practices cannot be attributed to climate mitigation and adaptation alone. As Figure 3 shows, the most important factors for farmers to adopt a new practice included: cost (42%), farm productivity (26%), environmental impact (14%), community improvement (10%), Ethics (6%), and time (2%).

Future Research Directions

This study demonstrates that farmers in Hawkes Bay have already implemented a number of practices to assist with changes in climate and reducing GHG emissions. However, there are many potential impacts from such changes that should be considered. For example, if most animal producers view reducing stocking rates as a likely practice in the future this has significant implications for New Zealand agricultural productivity, farm income, and export markets.

Further analysis of this data will determine the factors that influence adoption decisions. Additional research in the future could continue to monitor the adoption of these practices to understand whether farmers' stated intentions result in their actual behaviors in the future. There is also a need to link social and natural science to understand the ecological implications of implementing practices of interest. To inform policy, the data will also be used to assess the potential economic and environmental shifts that may occur as a result of change in practice in the future.

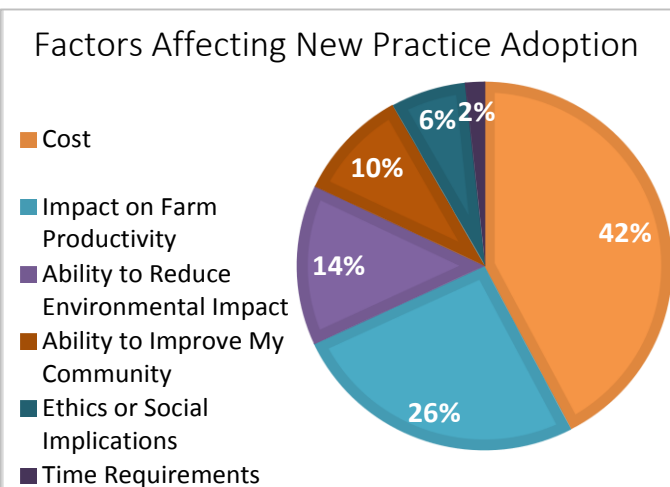


Figure 3. Most important factors when considering new practices.