Environmental product declarations

A comparison of certification schemes and their use in agricultural systems

MBS Thesis, Massey University

Supervised by:

Prof. Craig Prichard, School of Management
Prof. Sarah McLaren, Institute of Agriculture and Environment
Dr. Eli Gray-Stuart, School of Engineering and Advanced Technology

Regulatory and environmental pressure

North Island regulatory summary

Region	Plan Status	Pending Plan Reviews/Changes	Consenting Framework	Nutrient Budget	FEP
Northland	Decision pending (2019)	n/a	✗	✗	✗
Auckland	Operative	No	✗	✗	✗
Waikato	Operative; Proposed PC1 (2020)	Lake Taupo	✓ (PC1)	✓ (PC1)	✓ (PC1)
Gisborne	Under Appeal (2019)	n/a	✓	✓	✓
Bay of Plenty	Lake Rotorua nutrients under appeal	No	✓ (Lake Rotorua)	✓ (Lake Rotorua)	✓ (Lake Rotorua)
Hawke's Bay	Operative	TANK	✗	✓(Tukituki)	✓(Tukituki)
Taranaki	Operative	Possible	✗	✗	✗
Horizons Manawatu	Operative	Table 14.2; full plan review	✓	✓	✓
Greater Wellington	Decision pending (31 July 2019)	n/a	Cultivation & breakfeeding	✗	✗

South Island regulatory summary

Region	Plan Status	Pending Plan Reviews/Changes	Consenting Framework	Nutrient Budget	FEP
Nelson	Operative	No	✗	✗	✗
Tasman	Operative	No	✗	✗	✗
Marlborough	Decision Pending (2019)	n/a	✗	✗	✗
West Coast	Operative	No	✗	✗	✗
Canterbury	Operative	Yes – OTOP, Waimak (2019)	✓	✓	✓
Otago	Operative	Yes	✓	✓	✗
Southland	Under appeal (2019)	n/a	✓	✓	✓

The broader situation

The **conscious consumer** is a growing phenomenon worldwide (Marteau, 2017).

Greater access to **information** + **exposure** = **knowledge** of environmental, health and ethical issues

What's Valued? Price sensitivity is ever present

But the **health and environmental conscious consumer** is also shifting their focus to the **production process and validation or credibility of the claims** (Prichard, 2017; Marteau, 2017; Schau and Fet, 2008).

Result: Driving force behind the food industry's decision to introduce certification systems and eco-labels in both domestic and international food markets.

Research objectives

- Conduct LCA on a sheep dairy case-study farm in Wairarapa to offer a comparison to existing goat and bovine studies present
- *Undertake analysis on environmental certification schemes/eco-labelling and existing schemes present internationally*
- Develop key performance indicators (KPIs) for an LCA-based farm certification system focussed on sheep dairy systems in New Zealand.

What does an Eco-label comprise of?

- Firstly, what is covered - individual products and/or the wider organisation?
- Secondly, how the environmental performance of the product and/or organisation is determined by the targeted demographic of the consumer market?
- Thirdly, what type of environmental indicator measured? Carbon footprint or water use

Indicator types

1. System-state indicators concerning the state of the farming system - soil type;
2. Emission indicators related to the farm's polluting emissions - quantity of acidifying gaseous emissions;
3. Effect (Performance) -based indicators direct measurements to reflect the impact of the practices – MCI samples
4. Means (Technology)-based indicators assessing technical means and inputs used on the farm, such as stocking rates;

NZ Schemes

- CarboNZero; EnviroMark; Energy Star; WELS (Water Efficiency Labelling Scheme); SWNZ (Sustainable Winegrowers New Zealand)
- Several organic certification agencies which are available in New Zealand: AsureQuality, BioGro NZ, Organic Farm NZ, and the Organic Exporters Association of New Zealand (MPI, 2017)
- However yet to be a national programme that includes non-organic agricultural producers (McLaren et al., 2017)
- There is the impending National Environmental Standards (NES) being developed at present
- Matrix of Good Management and other voluntary GMPs, but no associated farm specific certification scheme as yet (McLaren et al., 2017)

Review of eco-label schemes

Four schemes compared:

- Sustainably Grown, US
- Origin Green, Bord Bia Ireland
- LEAF Marque, UK
- Unilever Sustainable Agriculture

Indicator no. and title	Sustainably Grown	Origin Green	LEAF Marque, UK	Unilever
Environmental	4.1.2 Pest control 4.2 Soil resources 4.3 Water resources 4.4 Air resources and climate 4.6 Energy efficiency 4.7 Integrated waste management	3.6 Land management 3.9 Biosecurity and pest control 3.12 Environment 3.14-3.17 Dairy-general 20. Chemicals	2.0 Soil management and fertility 4.0 Pollution control and waste management 5.0 Animal husbandry 6.0 Energy efficiency 7.0 Water management	1.0 Crop and pasture nutrient management 2.0 Pest, disease and weed management 3.0 Soil management 4.0 Water management 6.0 Energy and GHG emissions 7.0 Waste management

Research objectives

- Conduct LCA on a sheep dairy case-study farm in Wairarapa to offer a comparison to goat and bovine studies present
- Undertake analysis on environmental certification schemes/eco-labelling and existing schemes present internationally
- *Develop key performance indicators (KPIs) for an LCA-based farm certification system focussed on sheep dairy systems in New Zealand.*

KPI Framework Development

Evaluation of environmental certification schemes

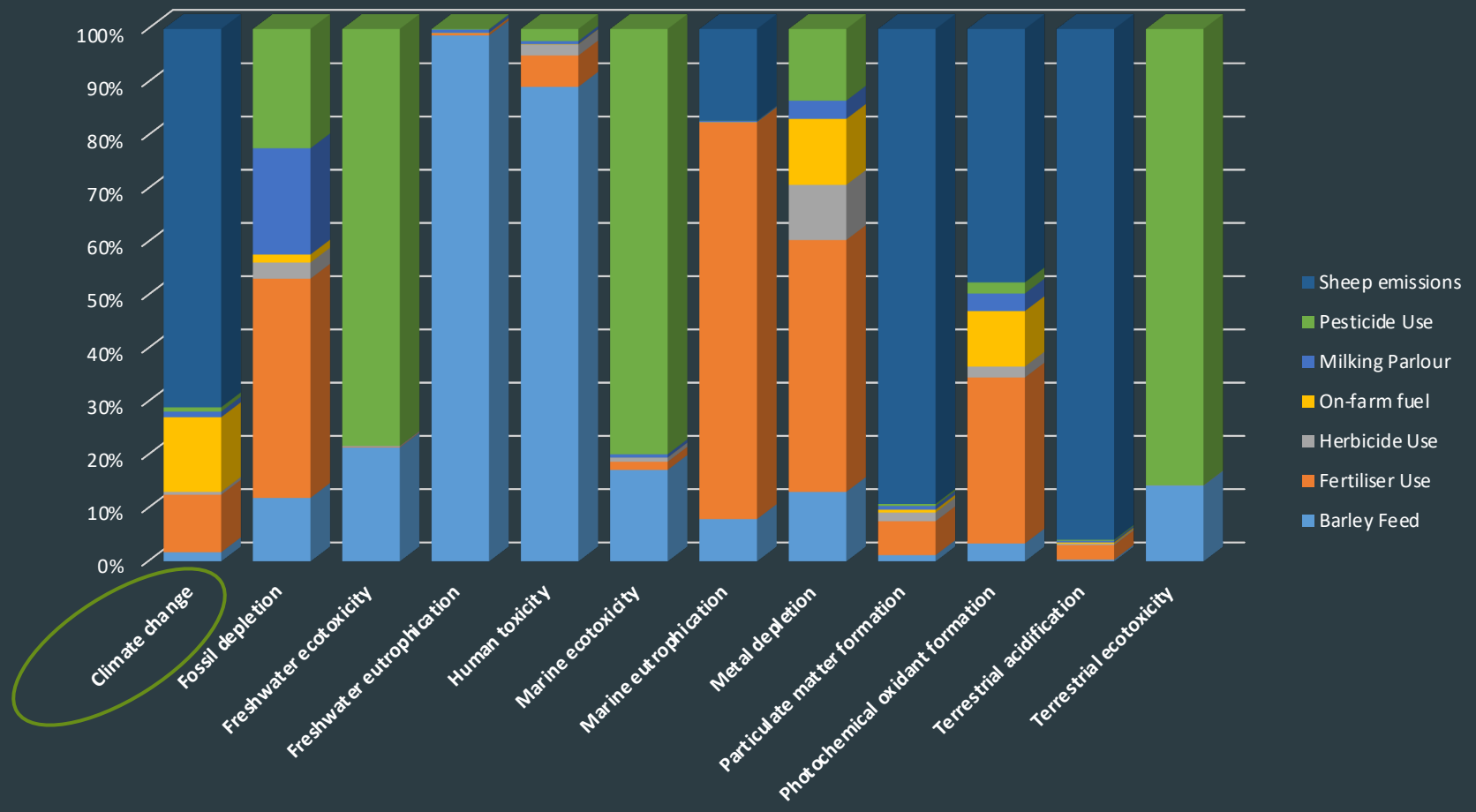
- Origin Green – Dairy (Bord Bia, Ireland)
- LEAF Marque (UK)
- Unilever Sustainable Agriculture Code
- Sustainably Grown Certified (US)

Determine means-based indicators utilising LCA results

KPIs were then selected for each respective category (as per Lebacq et. al, 2012) based on enviro hotspots identified

- Land Management
- Nutrient use
- Pesticide use
- Energy and Climate
- Water Quality

Life Cycle Assessment – Environmental Hotspots



Prioritised Focus (Based on LCA Results)	Hotspot Area	Classification	Indicator Topic	Proposed Indicator(s)
Terrestrial Ecotoxicity + Acidification + Marine Eutrophication + Freshwater Eutrophication	Agrichemical application and pasture/feed production	Land Management	Soil Map	A soil map must be prepared stating the different soil types present and the identification of areas prone to compaction, erosion, runoff and leaching.
	Fertiliser application	Nutrient	Nutrient Budget	Nutrient budgeting must be undertaken annually to determine nitrogen use efficiency, with mitigation measures documented.
	Pesticide use	Pesticide	Pesticide Drift Assessment	A risk assessment must be conducted to assess the risk of pesticide drift, with measures undertake to minimize the drift.
Freshwater Ecotoxicity + Marine Ecotoxicity + Acidification	Agrichemical applications	Water	Freshwater Management Plan	All potential wastewater sources and contaminant points must be identified on farm map and be treated appropriately prior to discharge.
Climate Change	Emissions from livestock grazing	Energy and Climate	Carbon Footprint Management Plan	Impact on the overall carbon footprint should be considered before increasing stocking rate/any major changes in livestock type reared

To conclude

Growing movement in primary industries due to increasing focus on the long-term viability of farming systems + social acceptance of welfare and environmental practices.

High level of variation in sustainability requirements and KPI frameworks utilised in schemes reviewed -> tricky for consumer

Thus, highlighting importance of a standardised process such as LCA to evaluate and form the basis of a sector-specific certification scheme

Aim was to show potential use of LCA in the development of sheep dairy certification systems with a case-study. Results not intended to be representative of entire NZ sheep dairy sector

Having more sheep milk producers undertake an LCA = better understanding of farm efficiency on an individual basis + more specific KPIs for our sector