Evaluation of voluntary agro-environmental schemes adopted by dairy industry in Canterbury, New Zealand

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Abstract - **Globally, there is an ample number of voluntary agro-environmental schemes, however little research has evaluated design of these particular schemes. In New Zealand, voluntary approaches in dairy farming industry are recent resulting in limited understanding on how dairy voluntary schemes are designed and implemented in a New Zealand farming context. This study strives to reduce this gap by examining desired attributes identified as relevant for effective voluntary schemes. Scholarly literature on design and maintenance of voluntary schemes identified a set of fifteen attributes that were used to evaluate ten agro-environmental schemes developed by key actors in Canterbury, New Zealand. This study aims to contribute to the body of knowledge of the development of future schemes and initiatives for dairy (and possibly other) industries.**

INTRODUCTION AND OUTLINE

The New Zealand dairy industry is currently faced with environmental challenges despite its economic success (Houlbrooke *et al.,* 2004). It produces over a third of the dairy products on the world market despite producing less than 2% of the total world dairy products (Ministry of Primary Industries, 2013). Over 90% of the dairy produced in New Zealand are exported.

Strategy for dealing with the environmental effects of dairy farming have moved away from the traditional command-control approach to a more voluntary approach, with the inclusion of voluntary agreements with the dairy industry, voluntary initiatives and conditions set in supplier contracts for farmers. The New Zealand Ministry for the Environment (MfE) supports self-regulation in mitigating the impact agriculture has on the environment and views these self-regulation measures as achieving more positive environmental outcome in contrast to relying on regulations alone. Blackett and Le Heron (2008) argue that there scientific evidence linking dairy practices with deteriating water quality, public concern over the quality of water resources and the need to maintain New Zealand's clean and green image are the key

imperatives that facilitated the rise of voluntary schemes in New Zealand. New Zealand dairy industry's position was further challenged by a high profile campaign led by Fish & Game (NGO) in 2002 that accused the industry of 'dirty dairying' (Blackett and Le Heron, 2008). The campaign contrasted to New Zealand 'clean green' image that is often portrayed at an international level. Clean and green image provides New Zealand with country's strategic differentiator that delivers various economic benefits such as increased tourism and branding for the produced products. Fish and Game campaign threatened not only the dairy industry, but New Zealand's economy as a whole. In response to the campaign and public concerns, Fonterra and local council developed the *Dairying and Clean Streams Accord* in 2003 (Fonterra co-operative Group *et al.*, 2003). The Accord was endorsed by Fonterra Co-operative Group, regional councils, Ministry for the Environment and the Ministry of Agriculture and Forestry (now Ministry for Primary Industries). Since Dairying and Clean Stream Accord, numerous initiatives emerged and in Canterbury, the most dairy intensive region in New Zealand, ten agro-environmental schemes were created by leading actors.

The use of voluntary schemes has been linked to improving environmental outcomes (Arora and Cason, 1996; King and Lenox, 2000; Khanna and Damon, 1999). As the adoption of voluntary schemes increases, an understanding on how they are designed is paramount to their credibility (Harrison, 2002). Darnall & Sides (2008) argue that one reason voluntary schemes are developed with weak design structures is due to the trade-offs between maintaining the schemes rigour, while trying to provide a flexible means to move participants beyond environmental laws. Thus there is a conflict prevalent between encouraging scheme's wider adoption and efforts to mitigate environmental (and social aspects) through increased stringency and calling for practices beyond regulatory requirements (Darnall *et al.*, 2003). Therefore, this study strives to understand what determines an effective voluntary scheme. An effective scheme design has been defined for this study as, "a scheme that improves the environmental performance of participants". These attributes should be seen as 'building blocks' of an

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effective scheme design. In light with the above, the objectives of this study are:

Firstly, identify voluntary schemes are used by the dairy industry in Canterbury?

Secondly, identify the desired attributes that form an effective voluntary scheme?

Thirdly, evaluate the current design of voluntary dairy schemes adopted in Canterbury region in respect to attributes of an effective voluntary scheme?

DATA

Three major data sources are used for this analysis. First, scholarly literature identified a set of fifteen desired attributes associated with effective voluntary schemes. These are presented along their definitions in Table 1. Second, a sample of ten schemes relevant for Canterbury region were identified for the review. These are Code of Practice (Westland Milk Products Ltd), Supply Fonterra (Fonterra), Lead with Pride (Synlait), BioGro NZ (NZ Biological Producers and Consumers Society), AsureQuality (NZ Government), LEAF Marque Global Standard (Linking Environment and Farming), Sustainable Dairying: Water Accord (Dairy NZ), SMART Irrigation (Irrigation NZ), Farm Environment Plans (The Central Plains Water Ltd), Code of Practice for Nutrient Management (Fertilisers Association NZ). Third, expert interviews were conducted to triangulate our findings.

Table 1. Desired attributes forming an effective voluntary scheme.

Attribute	Definition
Baseline	Provides a 'stick' by which improvements can be measures (e.g. Business as usual)
Benefits	Schemes provides tangible benefits to the participatants of the scheme
Incentives	Provides motivation for adoption of a voluntary scheme (e.g. market-based incentives)
Sanctions	Incentives to meet requirements of a scheme
Budget & Funding	Sufficient funding present to meet required targets
Target & Goal Setting	Targets and goals clearly specified to participants to the scheme
Performance Indicators	Frame of reference measuring effectiveness and progress against given goals
Reporting	Presence of reporting practices to the public
Information	Access to knowledge and know-how on how to adopt voluntary scheme effectively (e.g. technical assistance, best practice guides etc.)
Third Party Involvement	Scheme is assessed by an external party to the organisation adopting the voluntary scheme
Stakeholder Involvement	Breadth of stakeholder involvement in in the design of voluntary standard
Government Involvement	Government endorsement of voluntary scheme
Regulatory threat	Presence of regulatory threats to increase motivation to comply with relevant regulations
Monitoring	Regular monitoring evaluating progress against set targets and goals
Regulatory compliance	Seeking regulatory compliance as the minimal level of compliance to the scheme and encouraging performance beyond minimal requirements.

Note: references were removed to respect the prescribed length of this paper

METHOD

This study represents qualitative in-depth case study of adopted voluntary dairy schemes in Canterbury Region, New Zealand. The data is analysed through documents reviews and semi-structured interviews to seek triangulation of the results utilizing NVivo software. We approached the analysis with an 'open' or emergent procedure, allowing the data to speak (Balzarova and Castka, 2012). We used "free nodes" to label the central attributes. After this phase, we clustered free nodes into themes identifying key streams of focus forming the desings of dairy schemes.

ANTICIPATED RESULTS

The results of the analysis show where the greatest efforts are put in terms of design of voluntary dairy schemes. There is a good news for the environment that emphasis are put predominantly on monitoring and measurements of agro-environmental practices with particular focus to mitigate the adverse effects on the water quality. This is followed by increased emphasis to identify specific goals and targets which in return are encouraged to be verified by external parties. To some extent, some schemes offer incentives in a form of monetary compensation for increased milk quality. Interestingly, somewhat less important are seen issues associated with partnerships, levels of GHG emissions and soil health. Interestingly, least important emphasis are put on reporting as a key mean to communicate sustainable practices to the public.

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