

## DOING THE UNTHINKABLE: LINKING FARMERS' BREADTH OF VIEW AND ADAPTIVE PROPENSITY TO THE ACHIEVEMENT OF SOCIAL, ENVIRONMENTAL AND ECONOMIC OUTCOMES

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### Abstract

*Farmers produce products for markets that demand food safety and environmental sustainability, while working in a world challenged by a changing climate and decreasing water and energy resources. To meet these challenges they need to adapt and change their farming practices. We argue that studying farmer orientation from the perspective of 'good farming' offers an improved understanding of change in farm practices. In this article we develop the concept of 'breadth of view' to account for how farmers view the impact of their farming practices on social and environmental wellbeing. We then link this cultural capital to their self ascribed adaptive propensity and financial emphasis. Factor and cluster analysis of farmer survey data identified four clusters of farmers each with different combinations of levels of cultural capital to do with social and environmental breadth of view, adaptive propensity and financial emphasis. By considering the sheep/beef farmers from the ARGOS programme within these survey clusters we were able to associate the overall attitudinal qualities of each cluster with on-farm environmental and financial practices and outcomes. One cluster, which had the highest adaptive propensity and the highest social and environmental breadth of view achieved some higher environmental and economic outcomes on their farms. Using our knowledge of the farmers in this cluster we were able to ascertain the nature of their adaptation to demonstrate how they did things that were unthinkable to other farmers. The results are interpreted in terms of how breadth of view may have different effects, that is, be either a source of new ideas or a driver of conformity, and also to show how farmers may be able to achieve the unthinkable, suggesting it is possible for farmers to farm environmentally, socially and economically sustainably in quite different ways.*

**Keywords:** Cultural capital, farmer orientation, good farmer, unthinkable, breadth of view, adaptation.

### Introduction

It is generally acknowledged that to satisfy the changing demands of the market and governments for environmental sustainability will require constant change and adaptation of existing farming practices (e.g., Darnhofer et al., 2010). Before changing however, a farmer has to have the desire to change. As Buell (2001: 1) stated, "The success of all environmentalist efforts finally hinges not on 'some highly developed technology or some arcane new science' but on 'a state of mind': on attitudes, feelings, images, narratives". It is this latter component of change that is of interest here. The research and theory on the nature of attitudes and their connection to practices has so far made only a modest contribution to understanding how best to achieve desired improvements in environmental management (e.g., Austria - Schmitzberger et al., 2005; Norway - Setten, 2004; Finland - Silvasti, 2003; U.K. – Burton et al., 2008 and McEachern, 1992; New Zealand - Jay, 2007; Australia - Lockie and Higgins, 2007). By explaining how farmers are influenced by the norms of the culture around them, the 'good farming' literature (e.g., Burton, 2004b; Stock, 2007) has promise to show how better to achieve change towards more sustainable farming practices.

This theoretical approach concentrates on “language, meaning, representation, identity and difference” (Burton, 2004a: 361), using qualitative research to study farmers as legitimate actors and seeking to more fully understand why farmers do what they do. Burton (2004b: 207) describes the ‘good farmer’:

*“... for many farmers it [the landscape] represents a picture of good farming practice, displayed in a manner that enables the farmer to obtain social status and recognition within the community as a ‘good farmer’ and to judge the credentials of others. The farm is not simply an object, it is consubstantial with the farmer and, importantly, it is the very part of the farmer that is used to express his/her and his/her family’s identities, both to other members of the farming community and to the world in general.”*

Jay (2005) in her study of intensive dairy farming in New Zealand where high production is prized, explains how farmers saw native bush on a farm as “untidy, a sign of laziness, a source of pests and weeds or a waste of productive land” (Jay, 2005: 25). Similarly, Hunt (2010) describes the pressure on kiwifruit growers to have a tidy orchard. These examples suggest that farmers are not likely to change to ‘unthinkable’ practices unless they are able to visibly demonstrate use of their skills and knowledge in ways that are acknowledged and rewarded by their communities (Burton et al., 2008).

This article will show how the good farmer approach can be enhanced to offer a fuller understanding of change in farm practices. It introduces and explores the concepts of social and environmental ‘breadth of view’ developed by the authors to characterise the varying extent to which these aspects are taken into account in management practice. Substance is given to the theoretical argument by using the results of transdisciplinary research to link measurements of attitudes gained from surveys with on-farm practices and the results of those practices supported by environmental, financial, farm management and interview data. This provides richness and unexpected insights into farmers’ actions, demonstrating the possibility of farming practice that is adaptive, environmentally responsible and financially successful.

## Method

Findings reported in this article come from the first six years work of the Agriculture Research Group on Sustainability project (ARGOS – see [www.argos.org.nz](http://www.argos.org.nz)). The objective of ARGOS is to advance understanding of sustainable agriculture through the comparison of different management systems (conventional, integrated and organic) in the three main sectors in New Zealand agriculture (sheep/beef, dairy and horticulture). Farm-level research has been complemented by two national surveys of farmers and horticulturalists which enabled us to measure the prevalence of attitudes and perspectives discerned in interviews.

The 2008 survey consisted of random samples of conventional and registered organic farmers and horticulturalists (see Fairweather et al., 2009) of the sheep/beef, dairy and horticulture sectors from whom we gathered measures of breadth of view, importance placed on financial indicators and the likelihood of farmers adapting or changing their farming practices. Social breadth of view was measured by asking farmers to indicate their level of agreement on a seven point Likert scale with each of the three elements of the following statement:

My farm/orchard and my management of it are closely related to the wellbeing of myself and my family/the local community/the world.

Similarly, environmental breadth of view was measured by asking farmers to indicate their level of agreement with each of the three elements of the following statement:

My farm/orchard management affects the environment primarily within the productive areas of the property/in the region where my property is located/on a global scale.

The likelihood of farmers adapting or changing was measured by asking how often they considered or implemented the following strategies on a seven point scale from 1 (never) to 7 (always):

I adopt proven practices rather than do my own experiments.  
I seldom deviate from established farm plans.  
I learn new things by talking to a variety of people.

We measured the importance (on a seven point Likert scale) that farmers placed on indicators of financial performance - gross income, working expenses, actual income versus budget income, cash surplus/deficit, net profit/loss, changes in equity, ratio of working expenses to gross income, and return on capital. Another statement on a farmer's general approach to management asked how often on a seven point scale from 1 (never) to 7 (always) they considered or implemented the following strategy:

I pay close attention to money in the bank and good financial returns from each part of my business.

Survey results can only suggest that farmers use different practices as a consequence of their attitudes but do not provide direct evidence of this. This problem can only be resolved by making assessments of actual on-farm practices. For the usual sample sizes involved in farmer surveys this is very difficult both logistically and financially. The ARGOS research programme provided one way to do so. By having participant farmers complete the survey questionnaire it was possible to make linkages between the attitudinal and on-farm datasets. In this way ARGOS farmers were positioned within the survey data, and then used as representing farmers with the particular attitudes represented in the survey.

Single indices were obtained for each group of variables that measured breadth of view (social and environmental), financial emphasis and adaptive propensity respectively, by using Principal Component Analysis (PCA). These four indices (each standardized to fit a unit normal distribution) were then subjected to a cluster analysis which produced a four cluster solution that differentiated between farmers over each of the indices.

Finally, to examine the relationship between the attitudes of those in the clusters to the results of those attitudes on practices and outcomes on the farm the cluster membership was restricted to ARGOS sheep/beef farmers and unbalanced analyses of variance were carried out over the collected on-farm variables<sup>8</sup> for the 25 farmers for whom we had full data sets.<sup>9</sup> Many of the on-farm variables could also be influenced by factors such as management system and location, and covariates to do with farm size and/or percentage of farm return from cropping, therefore, where appropriate, these factors or covariates were accounted for in the analysis. For example, soil characteristics could also be related to a farm's geographical location. By using these factors in the analysis it could be decided if a difference between clusters was simply due to one of these factors or variables, or whether it indicated a high possibility of a 'real' difference. We also referred to the

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<sup>8</sup> The ARGOS sheep/beef farmers were chosen rather than the dairy farmers or kiwifruit orchardists simply because they were the ARGOS sector group for which we had collected the most on-farm information. At some point we will also do these analyses for the other ARGOS sector groups.

<sup>9</sup> Over the six years of the programme there has been considerable attrition as farms have been sold or other events have disrupted the collection of data – such as relationship breakups in the farming couple, or changes to a different form of farming such as dairying.

knowledge we had of ARGOS farmers from our interviews (see Hunt et al., 2005 and 2006; Rosin et al. 2007a and 2007b).

## Results

PCAs carried out for each group of variables gave indices for each survey participant of social breadth of view (64% of variation explained), environmental breadth of view (61% of variation explained), financial emphasis<sup>10</sup> (47% of variation explained) and adaptive propensity (44% of variation explained). When considering the propensity to adapt, analysis of the data showed that the first two measures were positively correlated with the third, meaning that the more farmers said that they learnt new things by talking to others, the more likely they were to not experiment and not to deviate from plans. This meant that though the adaptive propensity index only explained 44 percent of the variation, we considered this quite satisfactory because it was a weighted average which placed greatest weight on the two variables about doing experiments and less weight (but still some) on 'learning new things by talking to a wide variety of people'.

A cluster analysis on these four factor scores produced a very satisfactory four cluster solution<sup>11</sup>, each cluster providing a good mix across the indices. Table 1 presents the average score for each index in each cluster<sup>12</sup>. Farmers in Cluster 4 are of the most interest because while they have a lower financial emphasis, they are the ones with the broadest social and economic breadth of view and the strongest adaptive propensity.

**Table 1: Location of each cluster on the four indices**

Index	Cluster			
	1	2	3	4
Financial emphasis	+0.6	+0.4	-0.9	-0.2
Social breadth of view	+0.6	-0.4	-0.9	+0.7
Environmental breadth of view	+0.7	-1.1	-0.3	+0.7
Adaptive propensity	-0.8	-0.2	+0.3	+0.9
No. in cluster (%)	133 (27%)	129 (26%)	118 (24%)	115 (23%)

When the clusters were compared by using the ARGOS farmers in each of the clusters as representing all farmers in that cluster, it was found that two of the four ARGOS farmers in Cluster 4 had a heavy emphasis on cropping as part of their business. This meant that farmers in this cluster on average spent more over six years on costs associated with cropping, fertiliser (whether per hectare, per stocking unit or per farm), vehicles and fuel, and labour. Overall financially over six years, Cluster 4 had the highest farm working expenses, cash farm expenses and operating expenses whatever factors and covariates were used in the analysis. They applied more phosphate and magnesium in fertilizers however they were measured and analysed. These variables represent on-farm practices.

<sup>10</sup> We debated the name given to this measure. It was mainly a measure of the importance placed on these variables as indicators of financial performance, however, each variable correlated highly significantly ( $p < 0.01$ ) with the one about how often the farmer considered or implemented the strategy of 'paying close attention to money in the bank and good financial returns from each part of my business' which indicated to us that a high score on the indicators also demonstrated an emphasis on financial matters.

<sup>11</sup> This used the Quick Cluster procedure in SPSS.

<sup>12</sup> The values in this table are standardised - a negative value does not indicate a negative meaning for the attribute it measures. In other words, these values should be used for purposes of comparison between the clusters rather than as having some absolute meaningful value.

The results of these practices also showed up Cluster 4 as different from the other clusters. These farmers had on average over six years a higher effective farm surplus per hectare or per farm whether or not feed surplus was accounted for, and a higher farm operating surplus. The two more pastorally based farms had fewer Californian and nodding thistles but more dock, and produced meat more cheaply than their counterparts in the other clusters.

When the interview data and our knowledge of the four farmers were considered, it was found that these Cluster 4 farmers had very few practices in common. This surprised us and demonstrated the importance of interviewing and knowing our participants.

One of the farming couples in Cluster 4 based their enterprise mainly on beef cattle. They made sure they had holidays every year – which is different from most of the ARGOS farmers. In recent times they have purchased a hill country property to meet the dream of the male of the couple. This land can be used to maintain stock when the coastal property is experiencing drought conditions. Both of these attributes increase the resilience of this farm. Also, it gave this farmer a new interest at a time when his interest in farming was perhaps becoming a little bit stale.

Another Cluster 4 farmer likes to take risks of both a physical and financial nature. He moved to deer farming at the very beginning of this trend and then quickly changed to farming only stags for their velvet, when this was very profitable. He later became organic, an unthinkable practice in the macho farming circles he moves in, for similar commercial reasons. He does not farm steep slopes which are not profitable (leaving them covered in woody weeds) and has chosen not to clear streams which keeps the waterways in a pristine condition.

The other Cluster 4 farmer who practices organics also is a risk taker who produces organic vegetable seeds for a European company – a very risky enterprise requiring a large investment in the original seed and no return for nearly two years – the length of time needed to get some crops from planting through harvesting to payment. He leases land and is involved in share farming, both of which give him greater flexibility. He and his partner have developed their waterways with native plantings and the stream on this property improved in clarity. Sheep are used in a way that complements the other farm activities.

The final farmer in Cluster 4 uses every part of his farm in a carefully balanced system, so it is not over stressed. He has a wide range of sources of income trying new crops if he feels they fit into his system. Similarly, he uses practices such as minimum tillage (see Coughenour, 2003), saving on energy and enabling him to have a quick turn-around in his cropping and lamb finishing rotations. Having decided his farm was a business has given him permission to operate in new 'fields' and take a legitimate interest in all sorts of things. He reads widely, for example, keeping up with what is happening in other agricultural industries such as dairying because it may give him clues about what might happen in the future.

### **Discussion and conclusion**

Breadth of view may be linked to doing the unthinkable in a number of ways. First, farmers with a greater breadth of view may source their ideas more widely and be less concerned about how they are evaluated by the people around them. This makes them free to be different and to do what, for those with a narrower breadth of view, is unthinkable. Second, farmers with a narrow breadth of view may be tied into local definitions of good farming and be very concerned about local traditions and culture and less likely to do anything different. Third, a wide breadth of view may provide a source of new ideas and supportive networks thus encouraging innovation and doing what is unthinkable to others. In a related vein, wider breadth of view may mean that farmers are more sensitive to the ideas of others outside the farming community, including those who criticize farming practices, and are therefore more willing to change farm practices and do the unthinkable. In

this way we argue that breadth of view is a component of cultural capital. It is an attribute that enables farmers to act (or not act) in particular ways by putting to use the knowledge and 'know-how' they have acquired and are able to 'read' (symbolically from the 'signs' around them as well as literally), or gain from their social networks. This 'knowledge', awareness or learning which is often unconscious, will become embedded in their practices. Modern farming is involved in an increasing number of enterprises as many farmers diversify the number of products they produce to decrease risk. Hence a farmer with a wider social breadth of view is likely to have the wherewithal to negotiate his/her way in a greater number of different arenas and their associated markets.

This article raises a question about the role of breadth of view in bringing change to farm practices. Our results support a qualified answer. The principal finding of the foregoing analysis of the survey responses is the evidence of diverse relationships between breadth of view and adaptation propensity. We have shown that breadth of view acts differently for different farmers. For some it is a source of new ideas and networks that encouraged change while for others it was a driver of conformity. While a good proportion (50%) of farmers, those included in Cluster 1 and Cluster 4, were similar in that they shared a wider social and environmental breadth of view, the contrasts between them were in their propensity to adapt and their emphasis on financial indicators. Cluster 4 farmers were prepared to experiment – they were more likely to learn new things by talking to people and to break away from their plans and proven practices. They were also less likely to use financial returns as a measurement of their success and identity, yet achieved much higher returns than the others. They demonstrate that sustainable social, environmental and financial gains can be achieved by those who are prepared to change.

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