

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: To adjust to a world that is changing socially, environmentally and economically, farmers will need to farm sustainably and be adaptive, entrepreneurial and resilient. They may have to farm in ways that are unthinkable to them. We suggest that supporting and encouraging farmers' social and environmental 'breadth of view' or awareness of the impact of their farms on the wellbeing of themselves, their families, communities and the wider world environmentally and socially may lead to them being more likely to adapt and change their practices.

By calculating attitudinal indices of social and environmental breadth of view, propensity to adapt, and importance placed on financial criteria from a farmer survey we were able to link the way these qualities interacted to affect farmers' practices and actions, through comparison with on-farm data collected from farmers in the ARGOS program. Using a 'good farming' perspective to interpret what we found, we demonstrate how breadth of view informs farmer's actions and practices in two ways: to conform or to change. Farmers with the broadest breadth of view and the highest propensity to adapt, were more entrepreneurial through adjusting their practices more to the world in which they found themselves and were able to farm financially successfully and environmentally sustainably.

Keywords: sustainability, adaptation, resilience, entrepreneurial, social breadth of view, environmental breadth of view, good farming, social wellbeing, environmental wellbeing

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; 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, 2004a; 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, 2004b: 361), using qualitative research to study farmers as legitimate actors and seeking to more fully understand why farmers do what they do. Burton (2004a: 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.

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.

Good Farming, Unthinkable Practices and Breadth of View

Much of the good farming literature has built upon Bourdieu's theory of practice (Bourdieu, 1998, 1990) to explain farmers' proclivities to certain actions. In this approach, a key question is: how do farmers come to see the unthinkable (such as a novel environmental practice) not only as thinkable, but do-able and transformed into action? The three key concepts in this theory, 'habitus' (Setten, 2004; Raedeke et al., 2003), 'field' (Carolan, 2005) and 'capital' (Burton 2004a; Burton et al. 2008), are usefully applied to farming and farmers as the previous references testify. *Habitus*, described as a 'disposition to act', is not necessarily conscious or articulated but becomes embodied in people through practice (Adams, 2006: 514-516), providing them with knowledge of what is the 'right thing to do' (Bourdieu, 1998: 8; Setten, 2004). As a result, some actions are unthinkable (Bourdieu, 1990: 59; Shucksmith, 1993: 468). *Habitus* is acted out/practiced/performed in the relationship between *fields* and *capital* (Bourdieu, 1990: 66-79). Fields are structured around competition for capital governed by rules - laws, regulations, policies, or social norms. However, such 'rules' can reduce the chance of farmers taking up environmentally sustainable practices because these practices fall into the category of being unthinkable. Capital can be of four main types. It may be symbolic giving a person status in a field, economic, social, in the form of social networks, or cultural. Cultural capital is described as knowledge gained from education or other sources. Of particular interest to this article is cultural capital in the form of 'know-how' which enables a person to interpret the symbolic nature of capital in a field. Burton et al. (2008) assert that farmers are able to 'read' the signs of 'good farming' and so aspire to incorporate them into their own practices. To not do so becomes unthinkable within a farming community.

Unthinkability has been demonstrated by Jay (2005) in her study of intensive dairy farming in the Waikato district of New Zealand in which high production is prized. Farmers who opposed having native bush on their property saw it as "untidy, a sign of laziness, a source of pests and weeds or a waste of productive land" (Jay, 2005: 25). The kiwifruit industry in New Zealand rewards economically those who have taken a risk to grow gold kiwifruit or use organic management but some members of the community award status to those who have a tidy orchard and this goal can work against achieving higher economic returns and environmental sustainability (Hunt, 2010). What these examples suggest is that farmers are not likely to change their practices unless they are able to visibly demonstrate their skills and knowledge in ways that are acknowledged and rewarded with symbolic capital in their cultural communities (Burton et al., 2008).

After our first interviews with the farmer participants in our research program (Hunt et al., 2005, 2006) we were intrigued by those who placed themselves and their actions in a global context.

They read beyond their field of work and were interested in what was going on in the world rather than limiting themselves to interest in their local communities or particular aspects of the world such as national sporting achievements. Some even felt that by following particular farming practices such as farming organically, they were benefitting the global environment, and providing the world with better quality, healthier food. We hypothesized that these farmers would also be more likely to perceive the full extent of the consequences of their farm and its management. Did they see their farm and its management as affecting the wellbeing of themselves only, or did it affect the local community or the world? Did they see their farm and its management affecting the environment primarily within their property, or did it affect their region or the world? We named these concepts social and environmental breadth of view respectively.

For farmers to adapt to changing circumstances, they may have to do something new or to change their farm practices in ways that are unthinkable to other farmers. Some may be cautious and watch others changing, waiting to see how a new practice works out or becomes more acceptable. Just as certain practices will be unthinkable to a person with a breadth of view restricted to the community around him or her, so will other practices be unthinkable to someone with a more global breadth of view. Doing the unthinkable may also be linked to financial factors, that is, ensuring good returns may entice or force farmers into doing the unthinkable. Hence, we suggest that good farming, adaptability, financial focus and breadth of view are linked and will result in differing on-farm practices and outcomes.

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). 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 from 1 (very strongly disagree) to 7 (very strongly agree) 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 from 1 (very unimportant) to 7 (very important) 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 for the 25 farmers for whom we had full data sets. 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 knowledge we had of ARGOS farmers from our interviews (see Hunt et al., 2006; Rosin et al. 2007).

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 emphasis⁵¹ (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'.

⁵¹ 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.

A cluster analysis on these four factor scores produced a very satisfactory four cluster solution⁵², each cluster providing a good mix across the indices. Table 1 presents the average score for each index in each cluster⁵³. 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.

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 waning.

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 stags only 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.

⁵² This used the Quick Cluster procedure in SPSS.

⁵³ 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 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 improves 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 acquired the knowledge required 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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