

# MEASURING IMPACTS OF AN HOLISTIC FARM BUSINESS MANAGEMENT TRAINING PROGRAM

Donald Cameron and Shankariah Chamala

School of Natural and Rural Systems Management, University of Queensland, Australia

## ABSTRACT

*This paper reports on the development of 4 new instruments to measure impacts of an extension program on farming family participants. A case study approach within an action research framework incorporating qualitative and quantitative domains was adopted to explore the impact on Queensland farmers of FutureProfit, a farm business management extension program.*

*Two of these new measures, **Management Constructs Change** index and **Management Objectives Change** index, provided evidence of statistically significant changes in participant beliefs about, and attitudes towards farm business management. Although highly correlated with each other, these changes were unrelated statistically to any of seven other commonly used biographical or psychometric indices employed, including level of formal education.*

*The third measure, the **Bennett Change** index, provided statistically significant evidence that attitudinal and behavioural changes were more frequent in participants with less formal education, but also more frequent in participants who had high urbanisation and self-directed learning index scores.*

*A fourth measure, **Values Domain Change**, derived from the Management Objectives Change index, condensed objectives change data into values domain-oriented scales, and showed that attitudinal change occurred across a wide spectrum of the recognized human values domains.*

*Several conclusions are drawn from these findings, chief of which is that the approach used has successfully quantified impressionistic data in a way that offers potential for other researchers to document program impacts in terms other than 'hard quantitative measures such as changes in profitability.*

## INTRODUCTION

The purpose of this paper is to report on a number of new instruments developed as aids to evaluation of the Property Management Planning (PMP) extension program in Queensland. The PMP program is a nation-wide initiative with the fundamental objective of improving the adoption and use of property management plans by the farm sector. This program has been previously described in this forum (Letts 1997, Cameron and Chamala 1999), so salient details need only brief treatment. The program consists of seven or eight themed workshops, known as the 'integrated workshop series' (IWS), delivered to groups each of five to ten family management teams, over a period of 8 to 12 months, and structured around a strategic planning process. The program (i) is whole-systems in orientation; (ii) operates at whole-farm scale; (iii) employs principles

of strategic planning and action learning; and (iv) employs principles of adult or facilitative learning.

This paper is one of a series describing the approach taken to documenting program impacts. The focus here is on describing efforts to objectively quantify impressionistic or qualitative data gathered through semi-structured interviews supplemented with completion of constructed opinionaires. Construction of four indices is described: *Bennett Change*; *Management Constructs Change*; *Management Objectives Change*; and *Values Change*.

## **METHODS**

The subjects of the evaluation were 23 families and 46 individuals in the first four groups in central and southern Queensland to complete the IWS. Semi-structured interviews were conducted on-farm with all family management team members who had attended part or all of the workshop series. The main thrust of the interview was documenting changes perceived by participants to be partly or fully attributable to the IWS. To augment semi-structured interviews, respondents were asked to complete two questionnaire instruments designed to capture perceptions of changes to management objectives and management constructs.

### **Bennett Change Index**

The schema selected for studying program impacts was the seven-levels-of-evidence 'hierarchy' devised by Bennett (1975) for extension program evaluation. The upper three levels were most pertinent to this evaluation. They are, respectively: Level (5) benefits through changes in knowledge, attitudes, skills and aspirations(KASA); Level (6) changes to practice implemented; and Level (7) resulting outcomes.

The Bennett Change Index was constructed by allocating to one of these categories all changes identified by participants, and devising an index score based on the sum of all changes identified by each family team.

The **Management Constructs Change** rating instrument was developed to capture program impacts in terms of changes in participants' beliefs about 'good' management. Its development followed a two-phase process, in a method based on Personal Construct Psychology (Kelly, 1955), and adapted by Ilbery and Hornby (1983) and Briggs (1985).

In the first stage, participants were asked to think about the questions, *'What makes a good manager? What is it that good managers do, that makes them better or more*

*successful than other managers?’* This technique elicited a total of 82 management statements, from which 25 different constructs were distilled. These were grouped into four categories: **attributes** good managers have; **actions** good managers take; **attitudes** good managers have; and **cognitive skills** good managers demonstrate. (See Appendix 1).

In the second stage, these 25 constructs were listed in a questionnaire where each could be rated for its importance to management, on a Likert scale from 1 (unimportant) to 7 (extremely important). Respondents were asked to rate for importance each construct twice: ‘now’ (at the end of the program), and ‘before the program commenced’. This allowed demonstration of two attributes of their attitudes towards management: (i) the relative rating, at the end of the program, of the importance of each construct, and (ii) the possible impact of the PMP program, through perceived changes in relative rankings of constructs.

The Management Constructs Change index was developed by summing the mean absolute ratings change for each individual.

The **Management Objectives Change index** was developed from a questionnaire made up of 60 objective statements covering the full spectrum of management responsibilities. Participants were asked to rate these sixty possible objectives twice, for before and after completing the PMP program, on a scale ranging from -1 (opposed to my beliefs), through 0 (unimportant), to 7 (of supreme importance).

The **Values Domain Change** measure was constructed to explore the possibility that changes in participants’ perceptions of the relative importance of various management objectives were associated with deeper restructuring of their values sets. If so, this would provide evidence of significant and long-term program impacts. In the widely accepted normative view of management behaviour, management actions proceed, through a series of iterative processes, from explicit and implicit objectives or goals. Goals are related to attitudes, which in turn are functions of an individual’s belief system or values set (Rokeach 1968).

‘Values’ are defined as: ‘Concepts or beliefs about desirable end states or behaviours that transcend specific situations, guide selection or evaluation of behaviours and events, and are ordered by relative importance’ (Schwartz 1994). Consequently, individuals may rate or rank-order values/goals statements for relative importance.

Furthermore, such rankings can change, accompanied by congruous long-term attitude and behaviour change (Rokeach 1973; Grube et al. 1994; and Waller 1994).

A theme of the values literature is the identification of a number of motivational domains (typically 7 to 11), universal across all cultures, into which values may be categorised (Hall 1986; Schwartz and Bilsky 1987; Schwartz 1994; Colins and Chippendale 1995). Therefore it was postulated that (1) it would be possible to aggregate management objectives into values domains, and (2) measured changes in management objectives preferences over time represent changes in underlying values orientations.

#### **Values Orientation scales**

Embedded within the list of 60 objectives statements were eight possible values orientation scales, each of which could be related to a values 'domain' of Schwartz (1994) or 'cluster' of Hall (1991) and Colins and Chippendale (1995). The intention was not to canvass exhaustively the full spectrum of the 125 or more identified values, but to sample a range of issues known to be of importance to practising farm managers, and to attempt to relate perceived attitude changes towards them to accepted values principles.

### **RESULTS AND DISCUSSION**

#### **Bennett Change Index**

Identified changes attributable to FutureProfit were totaled for each individual, to produce their Bennett Change Index score. Results presented in Table 1 show collation of individual scores into group totals. These results demonstrate the ability of participants to identify wide-ranging benefits from program involvement, and thereby the utility of the Bennett schema in documenting impacts. Individual scores were subsequently used in correlational analyses with a suite of other psychometric and biographical indices not reported here, where statistically significant positive associations were found with scores for self-directed learning, urbanisation and conceptual ability.

**Table 1. Changes in each Bennett category**

Group	Level 5 changes				Level 6	Level 7	Total changes
	Knowledge	Attitudes	Skills	Aspirations	changes Practices	changes Outcomes	
1	24	19	23	12	17	7	102
2	10	6	9	8	17	1	51
3	10	14	7	8	13	0	52
4	26	33	23	3	38	0	123
<b>Grand Total</b>	<b>70</b>	<b>72</b>	<b>62</b>	<b>31</b>	<b>85</b>	<b>8</b>	<b>328</b>

**Management constructs change**

The effects of the program across a spectrum of management constructs is evident in Tables 2 and 3, which show respectively the most notable impacts on construct ratings, and the change in perceptions of most important constructs (for parsimony only the top 5 are shown in each case).

**Table 2. Mean Pre- and Post-program ratings, and change in ratings, for management constructs, all groups (maximum rating=7)**

Management construct	Pre-PMP	Post-PMP	Change <sup>a</sup>
think and plan	5.31	6.31	1.00 ***
get involved in community	4.88	5.65	0.77 ***
professional approach to farming	5.85	6.54	0.69 **
aware of major constraints	5.62	6.31	0.69 ***
able to work with people	5.38	6.04	0.65 ***
<b>MEAN of all 25 constructs</b>	<b>5.47</b>	<b>5.90</b>	<b>0.43</b>

<sup>a</sup> : \*\*\* P<.001, \*\* P<0.01

**Table 3. Highest rating management constructs, pre- and post-PMP**

Top 10 management constructs, pre-PMP	Mean rating	Top 10 management constructs, post-PMP	Mean rating
manage for the future	6.24	manage for the future	6.60
look after the family	6.08	willing to listen, learn and change	6.58
willing to listen, learn and change	6.04	professional approach to farming	6.54
make decisions quickly	5.96	look after the family	6.38
accept change as a challenge	5.88	think and plan	6.31

**Management objectives change**

The impact of the IWS on management objectives was measured as for management constructs above. Data was aggregated within and across groups. Results are shown in Appendix 2, in which objectives are shown in their values domains, discussed below. Results show that the instrument was able to capture participants perceptions of the ways in which the program had contributed to reorientation of their approaches to management. The major changes identified, including a heightened awareness of the importance of planning, were congruent with program objectives.

### Values orientation change

Documenting change in values orientation proceeded through a two-step process: (1) validation of domain scales embedded in the list of objectives statements using Reliability Analysis, and (2) determination of changes in scale means, attributable to the IWS. In the first stage, exploratory scale construction led to the satisfactory combination of 59 of the 60 statements in eight domains scales, each containing between four and twelve statements, and meeting the scale reliability criteria of (a) minimum item-to-total correlation coefficients above 0.3, and (b) an alpha value above 0.7 (de Vaus 1995, p.256). Several of these scales were renamed to reflect the most dominant item or items (those having the highest item to total correlation) in each. Summary information relating to these eight scales, incorporating 59 of the 60 objectives items, is presented below in Table 4 and Appendix 2. Scale component items and mean rating changes are shown. The only objective excluded ultimately was 'provide a good education for children'.

Data presented in these two tables suggest that the program impacts extended beyond narrow, business-oriented issues to include stimulus of other values domains including environmental concern (Maturity), Prosocial, and Enjoyment. The only scale not to show substantial stimulus was Traditional. In view of both the statistical significance levels, and the changes in scale means, all scales apart from this one were influenced to a similar level.

**Table 4. Summary data for objectives/values scales**

Objectives/ Values scale	Equivalent Schwartz domain	$\alpha$ value	No. of items	Scale mean change	signif <sup>a</sup>
Progressive	Achievement	0.7762	12	0.520	***
Business control	Self-direction	0.8071	8	0.650	***
Economics/success	Achievement	0.7857	9	0.526	***
Traditional	Tradition maintenance	0.7804	5	0.237	*
Ecority	Maturity	0.7026	8	0.622	***
Recreation	Enjoyment	0.7028	6	0.816	***
Conservative	Security	0.6714	7	0.602	***
Collaborative	Prosocial	0.6781	4	0.566	***

a two tailed paired sample *t* test: \*\*\* significant at  $p < 0.001$ , \*\* significant at  $p < 0.01$ , \* significant at  $p < 0.05$

## CONCLUSIONS

The main purpose has been to report on the development and application of new approaches to documenting impacts of an extension program, rather than the impacts themselves, which have been reported previously. Semi-structured interviews with participants in PMP/FutureProfit presented strong impressionistic data that the program had made real impacts on individuals, families, their approach to management, and on the farm businesses they managed. The new indices described here have helped to document those impressions in meaningful ways that are derived from and in turn add to existing knowledge about meaningful human activities in a farm management context. It is suggested that these methods have potential applications for measuring impacts of other adult education and extension programs.

## REFERENCES

- Bennett, C. (1975). 'Up the hierarchy'. *Journal of Extension*, March/April, 7-12.
- Briggs, J. (1985). 'An exploratory study of farmers' choice of crops in Central Sudan'. *Trans. Inst. Br. Geogr.* N.S. 10:170-180.
- Cameron, D. C. and Chamala, S. C. (1999). 'Futureprofit in Queensland: the positive impact of an adult education program on sustainable farming' *Proceedings 12<sup>th</sup> International Farm Management Congress, Durban*, (Contributed Papers), International Farm Management Association.
- Colins, C. and Chippendale, P. (1995). *New Wisdom II: Values-Based Development*. Acorn Publications, Brisbane.
- De Vaus (1995). *Surveys in Social Research*. Allen & Unwin, St Leonards.
- Grube, J.W. et al. (1994). 'Inducing change in values, attitudes and behaviours: Belief System Theory and the method of Value Self Confrontation', *Journal of Social Issues* 50 (4) 153-173.
- Hall, B. P. (1986). *The Genesis Effect: Personal and Organizational Transformations*, Paulist Press, New York.
- Ilbery, B.W. and Hornby, R. (1983). 'Repertory grids and agricultural decision making: a mid-Warwickshire case study'. *Geographischer Annaler* 65(B) 77-84.
- Kelly, G.A. (1955). *Principles of Personal Construct Psychology*. Norton, New York.
- Letts, M.A. (1997). 'A humanistic approach to facilitating change in agriculture.' *Proceedings 11<sup>th</sup> International Farm Management Congress, Calgary*, (Contributed Papers), International Farm Management Association.
- Rokeach, M. (1968). *Beliefs, Attitudes, Values*. Josey Bass, San Francisco.
- Rokeach, M. (1973). *The Nature of Human Values*. Free Press, New York.
- Schwartz, S. H. (1994). 'Are there universal aspects in the structure and contents of human values?' *The Journal of Social Issues*. 50 (Winter), pp. 19-45
- Schwartz, S. H. and Bilsky, W. (1987). 'Towards a universal structure of human values'. *Journal of Personality and Social Psychology* 53(3), pp. 550-562.
- Waller, J. E. (1994). 'Dual processing in value self-confrontation: the role of Need for Cognition'. *Journal of Social Issues* 50 (4) pp. 175-188.

## Appendix 1. Management constructs elicited from farm managers

### What good managers do

1. are always organised and ready to go, timely with operations
2. don't skimp on inputs (go for high yields, even when prices are low)
3. get involved in community, interact with other farmers
4. have price & production benchmarks in head
5. keep in touch with current industry/market/political climate
6. keep in touch with lender, know cash position, don't overspend
7. keep up to date with new ideas and technology
8. take fewer risks because of the way they farm
9. take time to think and plan
10. understand their land, maintain resources, manage for the future (conservative, not exploitive)

### Attributes good managers have

11. ability to work with people
12. are aware of major limiting factors affecting farm and business performance
13. expertise, breadth of knowledge, skills that can't be taught, coming from long experience in farming, proven performance over a long period

### Attitudes good managers have

14. do the best you can with what you have
15. like a challenge, accept change in a positive way, want to improve
16. look after the family
17. prepared to use and pay for professional or scientific advice, services
18. professional approach, see farming as a business
19. willing to listen and change, prepared to learn

### Cognitive skills of good managers

20. able to make decisions, quickly when necessary
21. able to react to the immediate situation without losing control of longer term plans
22. able to stick with decisions, not change suddenly
23. able to take calculated risks
24. analytical, logical
25. innovative ability

## Appendix 2. Objectives clustered through Reliability Analysis into values domains, and mean change in Likert ratings for objectives and values domains

Value/Objective	Mean rating change	t test significance
<b>Progressive</b>		
seek new ways of doing things on the farm	1.000	
diversify activities on-farm	0.895	***
improve the productivity of the farm	0.711	***
have the best crops/livestock in the district	0.553	**
achieve/exceed local/industry production/price benchmarks	0.526	*
achieve or exceed production/price targets I set myself	0.500	*
maximise efficient use of all resources	0.474	*
adopt modern varieties, techniques & equipment	0.474	*
lead with new ideas	0.316	
maintain improvements	0.316	
have up to date machinery	0.289	
win at shows	0.184	
<b>Mean</b>	<b>0.520</b>	<b>***</b>
<b>Business control</b>		
become involved in farm business management group	1.105	*
develop a long term plan for the farm	0.947	***
achieve development plans already set	0.816	**
minimise operating costs	0.711	***
maximise profit	0.658	**
maintain tight control of budget	0.289	
increase size of farm business	0.026	
<b>Mean</b>	<b>0.650</b>	<b>***</b>



**Appendix 2 (continued)**

<b>Ecority</b>		
utilise resources sustainably	0.974	***
minimise chemical use	0.684	**
contribute to repairing environmental damage on our farm	0.579	***
improve visual/aesthetic appeal of farm	0.579	**
prevent pollution	0.579	**
encourage wildlife	0.553	*
leave the land as good as I found it	0.526	**
contribute to repairing environmental damage in the district	0.500	**
<b>Mean</b>	<b>0.622</b>	<b>***</b>
<b>Recreation</b>		
have annual holidays off farm	1.263	***
have outside interests	1.132	***
have recreation time with family	0.763	***
have recreation time individually	0.711	***
improve quality of life	0.421	
develop other skills outside farming	0.421	
<b>Mean</b>	<b>0.816</b>	<b>***</b>
<b>Traditional</b>		
stay in farming whatever happens	0.474	**
continue the family farming tradition	0.368	*
pass on the farm	0.211	
operate on day-to-day basis	0.184	
work independently	-0.053	
<b>Mean</b>	<b>0.237</b>	<b>*</b>
<b>Economics/success</b>		
improve living standards	0.737	**
have a comfortable living	0.658	***
contribute membership/leadership to industry organisations	0.579	*
achieve recognition as a top farmer	0.579	*
have respect in the community	0.579	*
have off-farm investments	0.553	*
control of the farm business and its assets	0.395	
provide employment	0.368	
expand business to make room for children	0.289	
<b>Mean</b>	<b>0.526</b>	<b>***</b>
<b>Conservative</b>		
minimise tax paid	1.263	***
minimise debt	0.947	***
maximise any legislative entitlements received	0.711	**
plan retirement	0.711	***
minimise risk	0.368	
eliminate debt	0.342	
have off-farm employment	-0.132	
<b>Mean</b>	<b>0.602</b>	<b>***</b>
<b>Collaborative</b>		
improve family communication	0.921	
help other farmers	0.737	***
contribute group membership/leadership to community affairs	0.579	**
work with others	0.026	**
<b>Mean</b>	<b>0.566</b>	<b>***</b>
<b>GRAND MEAN</b>	<b>0.574</b>	<b>*</b>

a two tailed paired sample *t* test: \*\*\* significant at  $p < 0.001$ , \*\* significant at  $p < 0.01$ , \* significant at  $p < 0.05$