

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

Factors Influencing the Adoption of Whole Farm Plans: A Wairarapa Case Study

**A thesis presented in partial fulfilment of the requirements
for the degree of Master in Applied Science
in Agricultural Extension**



**at Massey University
Palmerston North**

Sian Cass

2008

Abstract

Hill country erosion is a serious environmental issue in New Zealand. After widespread damage from storms in 2004, Horizons Regional Council initiated the SLUI programme. This programme relies on whole farm plans (Whole Farm Business Plans) as the core tool to address erosion on hill country farms. Several regional councils in New Zealand, like Horizons, rely on whole farm plans and continue to seek ways to achieve a high level of voluntary adoption by farmers.

A single case study was used to examine the phenomena of adoption of whole farm plans. This research answered the question: What factors influence the adoption by farmers of whole farm plans, and why these factors are influential? A review of historical farm plans identified plans most similar to Horizons Whole Farm Business Plans. These were located in the Wairarapa and this formed the case area. Farmers from two catchments in the Wairarapa, and key informants were interviewed to identify factors influencing adoption of farm plans.

Findings from this study, in the main, support adoption diffusion literature for agricultural innovations. The specific mix of interrelated factors that influence the adoption of farm plans, and the reasons for their influence, were identified and described. Characteristics of this case included the widespread adoption of farm plans, and farmers' perceived farm plan implementation as secondary to the core farm business. Factors associated with the compatibility of the innovation to the core farm business and the credibility of the organisation delivering farm plans provided important influences on adoption of farm plans. The circumstances of the farmers and their farm did not strongly influence adoption in this study because farm plans are customised and take into account each individual's circumstances. For an innovation such as farm plans that is considered secondary to the core farm business, factors easing implementation were important. This was contributed to by the characteristics of the innovation and by the delivery and support from the organisation. Key people played a significant role in farmers' decisions to adopt a farm plan.

Acknowledgements

Janet Reid, as the main supervisor, has been a friend and colleague throughout this thesis. Her thorough approach and determination to keep the iterative process going has been a test of endurance, but above that, often overwhelming generosity.

Terry Kelly has been involved with my masterate programme from the beginning. Over the five years of this journey he has provided me with consistent support and encouragement. His attention to detail has been a valuable contribution, and I have admired how his comments have made my brain tick over trying to find an appropriate change.

As for any challenge there has been a team of support. Alec Mackay helped to initiate this research and has been encouraging and supportive throughout. I would like to thank Horizons Regional Council for their financial assistance. Grant Cooper has been an important contact at Horizons Regional Council, likewise Dave Cameron and Stan Braaksma at the Greater Wellington Regional Council. Farmers interviewed in the Wairarapa and key informants associated with regional councils have all generously offered their time and knowledge. Denise Stewart has been an amazing asset fulfilling many tasks with incredible ease at the INR office. Many times friends and family have provided support to keep me going, grammatical expertise, and care of my children when I needed a longer day of study. In particular, Tim Upperton and Sally Babbage have filled in many gaps. My husband Jeff, and my two children George and Lucy have been an important part of the support and they have put up with a lot over the time of this project, so its now time to have some fun.

Table of Contents

Abstract	I
Acknowledgements	III
List of Tables	VIII
List of Figures	VIII
List of Acronyms.....	IX
CHAPTER 1 INTRODUCTION	1
1.1 Thesis Introduction.....	1
1.2 Research background.....	1
1.3 Problem statement	3
1.4 Research question.....	4
1.5 Research objectives	4
1.6 Research approach.....	4
1.7 Thesis structure.....	5
CHAPTER 2 LITERATURE REVIEW	7
2.1 Introduction	7
2.2 Innovation adoption frameworks.....	8
2.3 Factors influencing the adoption of agriculture innovations.....	12
2.3.1 Factors related to the innovation	13
2.3.1.1 Relative advantage.....	15
2.3.1.2 Compatibility.....	15
2.3.1.3 Complexity	16
2.3.1.4 Observability	17
2.3.1.5 Trialability	17
2.3.1.6 Temporal characteristics.....	19
2.3.2 Factors related to extension	19
2.3.2.1 Communication	20
2.3.2.2 Organisational Strategies.....	24
2.3.3 Factors related to farmer and farm characteristics	28
2.3.3.1 Goals.....	29
2.3.3.2 Beliefs and values, attitudes and behaviour	30
2.3.3.3 Age, education and experience.....	32
2.3.3.4 Farm size, farm tenure, & financial security	33
2.3.3.5 Farmers links with information sources	34
2.4 The Innovation Decision Process	35
2.5 Summary.....	38
CHAPTER 3 METHODOLOGY	41
3.1 Introduction	41
3.2 Research design.....	41

3.3	Case selection.....	43
3.3.1	Criteria for case selection.....	45
3.4	Site Selection and Sampling Procedure	46
3.5	Data Collection.....	47
3.6	Data Analysis	48
3.7	Ethical considerations	49
3.8	Summary	50
CHAPTER 4 CASE DESCRIPTION		51
4.1	Introduction.....	51
4.2	Farm plans.....	52
4.2.1	Catchment Control Schemes	54
4.3	Wairarapa case description	55
4.3.1	History of soil conservation and farm plan development	57
4.4	The Whareama catchment description.....	60
4.4.1	Farm and farmer characteristics	61
4.4.2	Factors affecting erosion.....	62
4.4.3	Environmental issues	62
4.4.4	Whareama catchment scheme	63
4.5	The Whangaehu catchment description	64
4.5.1	Farmer characteristics	64
4.5.2	Factors affecting erosion.....	66
4.5.3	Environmental issues	67
4.6	Summary	67
CHAPTER 5 RESULTS.....		69
5.1	Introduction.....	69
5.2	Factors that influence the adoption of farm plans and farm plan works.....	70
5.3	The compatibility of farm plan works with the core farm business.....	72
5.3.1	Ease of implementation of farm plan works	75
5.3.2	Benefits and costs for the farmer of farm plan works	78
5.3.3	Degree to which the farm plan and farm plan works are developed to specifically suit each farmer and their farm circumstances	82
5.3.4	Proven reliability of farm plan works	83
5.4	Characteristics of farmers and their farm circumstances	85
5.5	Credibility of the organisation delivering farm plans	88
5.5.1.1	Credibility of field staff.....	89
5.5.1.2	Organisational commitment to farm plan delivery	90
5.5.1.3	Organisational support of field staff	91
5.5.1.4	Organisation's integrity.....	92
5.6	Summary	93
CHAPTER 6 DISCUSSION		95
6.1	Introduction.....	95
6.2	Classification of the case.....	95
6.3	Factors that influence the adoption of farm plans and farm plan works.....	98
6.3.1	Compatibility of the farm plan works with the core farm business	103
6.3.1.1	Ease of implementation of farm plan works	104

6.3.1.2	Benefit - cost analysis of farm plan works	107
6.3.1.3	The match between farm plan and farm plan works, farmer and farm circumstances	110
6.3.1.4	The proven reliability of farm plan works'	110
6.3.2	Characteristics of farmers and their farm circumstances	112
6.3.3	Credibility of the organisation delivering farm plans.....	114
6.4	Summary.....	117
CHAPTER 7 CONCLUSIONS.....		119
7.1	Introduction	119
7.2	Research findings summary	119
7.3	Conclusions	121
7.4	Implications for regional councils.....	123
7.5	Assessment of research methodology	124
7.6	Further research	125
REFERENCES		127
APPENDICES.....		135
APPENDIX 1:	REPORT PREPARED FOR THE HORIZONS REGIONAL COUNCIL: HISTORICAL FARM PLAN DATA FOR HORIZONS REGION WHOLE FARM PLAN	137
APPENDIX 2:	TOPIC AREAS FOR INTERVIEWS IN CASE SELECTION.....	167
APPENDIX 3:	ETHICAL CONSIDERATIONS	171
	Introductory letter received by interviewees.....	171

List of Tables

CHAPTER 2: LITERATURE REVIEW

Table 2.1: Categories used to organise factors that influence the adoption of innovations	11
Table 2.2: Comparison of stages in the Innovation Decision Process	35
Table 2.3: Factors that influence stages of the Innovation Decision Process (adapted from Rogers, 2003).....	36

CHAPTER 3: METHODOLOGY

Table 3.1 Relevant situations for different research strategies (Yin, 1994, p.6).....	43
---	----

CHAPTER 6: DISCUSSION

Table 6.1: Characteristics of the case	96
--	----

List of Figures

CHAPTER 2: LITERATURE REVIEW

Figure 2.1. Stages of the Innovation Decision Process (adapted from Rogers, 2003, p. 163).....	9
Figure 2.2. A Model of Farm Context, Innovation Decision Process and Farmer Categorisation for Macrostructural Design (adapted from Duff et al., 1992, changes and additions italicised).....	10

CHAPTER 4: CASE DESCRIPTION

Figure 4.1. Erosion-prone Land Used for Drystock in the Wellington Region.	57
---	----

CHAPTER 5: RESULTS

Figure 5.1. Categories of Factors That Influence the Adoption and Implementation of a Farm Plan.....	69
Figure 5.2. Factors Contributing to the Compatibility of Farm Plan Works With the Core Farm Business	75
Figure 5.3. Factors Contributing to Characteristics of the Farmers and Their Farms	86
Figure 5.4. Factors Related to the Credibility of the Organisation delivering farm Plans	88

List of Maps

Map 1:	Location of Whareama and Whangaehu Catchments and the districts comprised in the Greater Wellington Region	51
--------	---	----

List of Acronyms

Acronym	Meaning
CCS	Catchment Control Scheme
CSS	Countryside Stewardship Scheme
ESS	English Stewardship Scheme
ESA	Environmentally Sensitive Areas
EU	European Union
GWRC	Greater Wellington Regional Council
IAFS	Integrated Arable Farming System
IPCC	International Panel on Climate Change
LMO	Land Management Officer
LRI	Land Resource Inventory
LUC	Land Use Capability
LWMP	Land and Water Management Plans
MAF	Ministry of Agriculture and Fisheries
OEFP	Ontario Environmental Farm Plan
SCRC	Soil Conservation and River Control
SLUI	Sustainable Land Use Initiative
WCB	Wairarapa Catchment Board
WFBP	Whole Farm Business Plans