

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

<b>Abstract .....</b>	<b>I</b>
<b>Acknowledgements .....</b>	<b>III</b>
<b>List of Tables .....</b>	<b>VIII</b>
<b>List of Figures .....</b>	<b>VIII</b>
<b>List of Acronyms.....</b>	<b>IX</b>
<b>CHAPTER 1 INTRODUCTION .....</b>	<b>1</b>
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
<b>CHAPTER 2 LITERATURE REVIEW .....</b>	<b>7</b>
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
<b>CHAPTER 3 METHODOLOGY .....</b>	<b>41</b>
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
<b>CHAPTER 4 CASE DESCRIPTION .....</b>		<b>51</b>
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
<b>CHAPTER 5 RESULTS.....</b>		<b>69</b>
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
<b>CHAPTER 6 DISCUSSION .....</b>		<b>95</b>
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
<b>CHAPTER 7 CONCLUSIONS.....</b>		<b>119</b>
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
<b>REFERENCES .....</b>		<b>127</b>
<b>APPENDICES.....</b>		<b>135</b>
<b>APPENDIX 1:</b>	<b>REPORT PREPARED FOR THE HORIZONS REGIONAL COUNCIL: HISTORICAL FARM PLAN DATA FOR HORIZONS REGION WHOLE FARM PLAN .....</b>	<b>137</b>
<b>APPENDIX 2:</b>	<b>TOPIC AREAS FOR INTERVIEWS IN CASE SELECTION.....</b>	<b>167</b>
<b>APPENDIX 3:</b>	<b>ETHICAL CONSIDERATIONS .....</b>	<b>171</b>
	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