Risk Management and Market Participation among Traditional Cattle Farmers in Monze District of Southern Province, Zambia

A thesis presented in partial fulfillment of the requirements for the degree of

Masters in AgriCommerce

at Massey University, Manawatu,
New Zealand

Belindah Chilala
2015
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.
Abstract

Traditional cattle farmers are the major contributors to the beef industry in Zambia as they account for 85% of the country’s cattle population. Traditional farmers however, are reluctant to sell their cattle and are more likely to sell when cushioning against crop production risk. Although some scholars say farmers sell their cattle more when faced with risk, there are other scholars who say the opposite that farmers are less willing to sell their cattle when faced with risk as they are trying to preserve their cattle asset.

This study was therefore done to identify sources of risk, risk management strategies, risk attitudes, cattle market participation and cattle selling channels of traditional cattle farmers in Monze district of Zambia. Mixed methods research was done by first using qualitative research through in-depth interviews to inform the quantitative research done using a questionnaire survey.

Likert scale type of questions were used to capture the farmers’ perceptions of risk and risk management strategies. In order to better understand risk perceptions of the farmers, upside and downside risk of the farmers were presented using risk choice matrix. The risk importance index was used to present the perceptions of risk and risk management strategies of the respondents.

Regression tree analysis was used to investigate relationships between market participation and the respondents’ perceptions of risk and risk management strategies of the farmers and their risk attitudes. Pearson’s chi-square was also used to investigate these relationships.

The results showed that the majority of surveyed farmers from Monze were risk averse. It was also found that these farmers mainly perceived production and market risk to be the most important sources of risk. These farmers did not perceive risk to be an opportunity but rather saw it more as a threat.

It was also found that the farmers exhibited four types of market behaviour based on how they participated in cattle markets. These were traders, sellers, buyer and holders. A farmer’s market behaviour was affected by different perceptions of risk and other farmer characteristics such as the main income generating activity of the farmer and the number of
cattle owned by the farmer. It was therefore seen that there was some influence of risk perceptions on market behaviour of farmers. These perceptions were affected by the risk attitude of farmers which were affected by the location of the farmers. It is therefore important to understand risk attitudes and perceptions of individual farmers from different farming areas.
Acknowledgements

The completion of this Masters thesis would not have been possible without the support of many people. My sincere gratitude goes to my thesis supervisors at Massey University. To Professor Nicola Shadbolt, from the beginning when I made the decisions to study Agricommerce you were there to offer the guidance and advice I needed. I am highly indebted to you for the support, for your patience and for inspiring me more than you know. To Dr Liz Dooley who had the patience and dedication to read the many versions of my thesis and guide me through the whole process, I am grateful for that dedication you had and for pushing me to continue even when I was getting tired. I am grateful to A/Prof Blessing Maumbe for his guidance and encouragement to push myself to the limit.

I extend my gratitude to the other Massey University staff members under the Agricommerce programme for their valued input in the completion of my Masters programme. Special thanks go to Denise Stewart for taking time to edit my thesis and to Emily Kawabata and Johnathan Geoffrey for their assistance in analysing the data. To my officemates in the postgraduate room, with special mention of Yanan Li and Somwadee Chaengchat I am grateful for the role you played in making my time away from my family easier.

My gratitude also goes to the New Zealand government for the scholarship they provided for me to study in New Zealand. Special thanks go to the NZDS office at Massey, Jamie Hooper, Leauaina Vaai-Hatier, Susan Flynn and Sylvia Hooker. I wish to extend my gratitude to the New Zealand High Commission office in South African for supporting me and my family during the entire process of getting to, staying in and living New Zealand.

I further extend my gratitude to my employers, the government of Zambia for allowing me to take time off work to pursue my studies. Special thanks to the late Dr Mabvuto Banda and the rest of the team at Zambia Institute of Animal Health for the encouragement. I extend my thanks to Fr Cheepa and Mr Mwiinga the former principal of Charles Lwanga College, who took the time to translate my questionnaire into Tonga, it was not an easy task. I am grateful for the help of Mr Enock Hankwilimba from Musiika Zambia, Mr Dennis Seponde from Parmalat Zambia, Mr Michelo Kasauti (Manager Monze Dairy
Association) and Dr Phanuel Nyimba the District Veterinary Officer for Monze for the assistance they rendered to me during my survey and data collection.

Special thanks to Dr Evelyn Nguleka, President for World Farmers Organisation (WFO) and Zambia National Farmers Union (ZNFU) for the last minute input on risk management options for farmers in Zambia.

Last but not the least, I would like to thank in a special way my family who stood by me through all the pressure. To my husband Raymond Hamoonga and the kids Nathan and Hannah, thank you for your patience and understanding. For the moments I spent crying on your shoulder when school was too tough, I am grateful to you Raymond. To my sisters Mainza and Kantu, my brothers Theodore, Rae, Mwaka, Alfred, Ntasa and Yorum thank you for always encouraging me.
Table of Contents

1 INTRODUCTION ................................................................................................... 1

1.1 Research Background ...................................................................................... 1
1.2 Problem Statement .......................................................................................... 4
1.3 Research Question .......................................................................................... 5
1.4 Research Objectives ....................................................................................... 5
1.5 Research Report Outline ................................................................................. 6

2 LITERATURE REVIEW ...................................................................................... 7

2.1 Introduction ...................................................................................................... 7
2.2 Background on Study Site ............................................................................... 7
  2.2.1 Country Description ..................................................................................... 7
  2.2.2 Monze District ............................................................................................. 8
2.3 Agriculture in Zambia .................................................................................... 11
  2.3.1 Pastoral Farming in Zambia ......................................................................... 12
2.4 Agricultural Risk ............................................................................................ 18
  2.4.1 Risk Attitude ............................................................................................... 19
  2.4.2 Risk Perceptions ......................................................................................... 20
  2.4.3 Sources of risk ............................................................................................ 20
  2.4.4 Risk Management Strategies ....................................................................... 21
  2.4.5 Agricultural Risk Management in the Global context ................................... 23
  2.4.6 Agricultural Risk Management in Africa .................................................... 25
2.5 Agricultural Risk in Zambia ............................................................................ 26
  2.5.1 Sources of Agricultural Risk in Zambia ......................................................... 26
  2.5.2 Agriculture Risk Management in Zambia .................................................... 28
  2.5.3 Empirical Research on Agricultural Risk Management ............................. 30
2.6 Cattle Markets in Zambia ............................................................................... 33
  2.6.1 The Beef Industry in Zambia ....................................................................... 33
  2.6.2 Empirical Research on Market Participation ................................................. 35

3 METHODOLOGY ............................................................................................... 38

3.1 Introduction .................................................................................................... 38
3.2 Research Strategy ....................................................................................................... 38
3.3 Research Design ......................................................................................................... 39
3.4 Site selection .............................................................................................................. 40
3.5 Qualitative Research ................................................................................................. 40
  3.5.1 Unit of Analysis .................................................................................................. 40
  3.5.2 In-depth Interviews ............................................................................................. 41
3.6 Quantitative Research ............................................................................................... 41
  3.6.1 Unit of Analysis .................................................................................................. 42
  3.6.2 Sampling Frame .................................................................................................. 42
  3.6.3 Pilot Survey ......................................................................................................... 42
  3.6.4 Sampling ............................................................................................................. 43
3.7 Data Collection .......................................................................................................... 44
3.8 Data Processing .......................................................................................................... 45
3.9 Analytical Tools and Techniques ............................................................................... 47
  3.9.1 Uncertainty Score cards ...................................................................................... 48
  3.9.2 Risk Choice Matrix ............................................................................................. 49
  3.9.3 Risk Importance Index ........................................................................................ 50
  3.9.4 Risk Management Strategy Importance Index .................................................... 51
  3.9.5 Risk Attitude ....................................................................................................... 52
  3.9.6 Cross-tabulation and Pearson’s Chi-Square........................................................ 52
  3.9.7 Regression Analysis ............................................................................................ 52
3.10 Study Limitations .................................................................................................... 55
3.11 Ethical Consideration ............................................................................................... 56

4 RESULTS AND DISCUSSION .................................................................................... 57
4.1 Introduction ................................................................................................................ 57
4.2 Characteristics of the Respondents ........................................................................... 57
  4.2.1 Introduction ......................................................................................................... 57
  4.2.2 Demographic and Farm Characteristics .............................................................. 58
  4.2.3 Descriptive Statistics .......................................................................................... 66
4.3 Perceptions of Sources of Risk and Risk Management Strategies ............................ 73
  4.3.1 Introduction ......................................................................................................... 73
  4.3.2 Perceptions of sources of risk ............................................................................. 73
  4.3.3 Assessment of Perceptions of Sources of Risk ................................................... 75
4.3.4 Assessment of Perceptions of Risk Management Strategies .................................................. 94
4.3.5 Risk Profiles .................................................................................................................................. 97

4.4 Marketing ........................................................................................................................................... 101
4.4.1 Cattle Marketing Trends ............................................................................................................ 101
4.4.2 Distribution of market characteristics of respondents by location ............................................. 102
4.4.3 Distribution of market characteristics of respondents by risk attitude .................................... 103

4.5 Cross-tabulation and Pearson’s Chi-square test ............................................................................. 107

4.6 Regression Analysis ......................................................................................................................... 109
4.6.1 Introduction .................................................................................................................................. 109
4.6.2 Principal Component Analysis .................................................................................................... 109
4.6.3 Logistic Regression Tree Analysis ............................................................................................... 117

4.7 Results and Discussion Summary ................................................................................................... 121

5 CONCLUSION AND RECOMMENDATIONS .................................................................................... 125
5.1 Policy Recommendations ............................................................................................................... 125
5.2 Future Research Recommendations ................................................................................................ 125

6 REFERENCES ...................................................................................................................................... 127

7 APPENDICES ..................................................................................................................................... 135
7.1 Appendix 1: Ethics Approval letter ................................................................................................. 135
7.2 Appendix 2: Survey Letter ............................................................................................................... 136
7.3 Appendix 3: Survey Questionnaire .................................................................................................. 137
7.4 Appendix 4: Classification of Sources of Risk and Risk Management Strategies for PCA .......................................................... 153
7.5 Appendix 5: Assessment of Sources of Risk and Risk Management Strategies .................................. 155
7.6 Appendix 6: Cross-tabulation and Pearson’s Chi-square results ....................................................... 168

Market behaviour by Experience of farm Manager ............................................................................. 168
Market behaviour by total number cattle owned ................................................................................... 168
Market behaviour by Household Size ................................................................................................... 169
Risk behaviour by Age group of Respondents .................................................................................... 173
Risk behaviour by Experience of farm Manager .................................................................................. 174
Risk behaviour by total number cattle owned .................................................................................... 174
Risk behaviour by Household Size ..................................................................................................... 175
Risk behaviour by Market Behaviour.................................................................175
Risk behaviour by Market Behaviour.................................................................176
Table of Figures

Figure 2.1: Map showing provinces and districts in Zambia. Source: CSO, Zambia...8

Figure 3.1: Scorecard for Potential to Benefit from Uncertainty. Source: (Shadbolt & Olubode-Awasola, 2013) .........................................................................................................................49

Figure 3.2: Risk Choice Matrix: Source: (Shadbolt & Olubode-Awasola, 2013)........50

Figure 4.1: Comparisons of age distributions across survey locations...............63

Figure 4.2: Comparisons of Farm Manager's experience across survey locations ......64

Figure 4.3: Comparisons of years in operation of the farm across survey locations...65

Figure 4.4: Comparisons of farm household size across survey locations ..........66

Figure 4.5: Risk Importance Indices for all respondents ranked in descending order.76

Figure 4.6: Risk Importance Indices for Bweengwa ranked in descending order ....79

Figure 4.7: Risk Importance Indices for Choongo East ranked in descending order ..79

Figure 4.8: Risk Importance Indices for Haatontola ranked in descending order ......80

Figure 4.9: Risk Importance Indices for Mwanza West ranked in descending order ..80

Figure 4.10: Risk Importance Indices for Traders ranked in descending order........83

Figure 4.11: Risk Importance Indices for Sellers ranked in descending order..........83

Figure 4.12: Risk Importance Indices for Buyers ranked in descending order ........84

Figure 4.13: Risk Importance Indices for Holders ranked in descending order ......84

Figure 4.14: Risk Choice Matrix for Bweengwa ....................................................86

Figure 4.15: Risk Choice Matrix for Choongo East ................................................87
Figure 4.16: Risk Choice Matrix for Haatontola ......................................................... 88

Figure 4.17: Risk Choice Matrix for Mwanza West .................................................... 89

Figure 4.18: Risk Choice Matrix for Traders ............................................................... 91

Figure 4.19: Risk Choice Matrix for Buyers ............................................................... 92

Figure 4.20: Risk Choice Matrix for Sellers ............................................................... 93

Figure 4.21: Risk Choice Matrix for Holders .............................................................. 94

Figure 4.22: Risk Management Strategies Importance Indices arranged in descending order ......................................................................................................................................... 97

Figure 4.23: Cattle selling trends ............................................................................... 102

Figure 4.24: Cattle purchasing trends ........................................................................ 102

Figure 4.25: Regression tree for Seller Model 1 ........................................................ 118

Figure 4.26: Regression tree for Holder Model 1 ...................................................... 119

Figure 4.27: Regression tree for Holder Model 2 ...................................................... 119

Figure 4.28: Regression tree for Buyer Model 1 ....................................................... 120

Figure 4.29: Regression tree for Trader Model 1 ...................................................... 121
List of Tables

Table 4.1: Demographic Characteristics ................................................................. 59
Table 4.2: Farm Characteristics ............................................................................. 62
Table 4.3: Descriptive Statistics grouped by Market behaviour ......................... 72
Table 4.4: Distribution of responses on perception of risk as an opportunity ....... 74
Table 4.5: Distribution of responses on perception of risk as a threat ................. 75
Table 4.6: Summary of results for risk importance index based on location ........ 78
Table 4.7: Summary of results for risk importance index based on market behaviour 82
Table 4.8: Distribution of responses on perceived importance of identified risk management strategies ................................................................. 96
Table 4.9: Risk profiles of respondents ................................................................. 99
Table 4.10: Risk Attitudes of Respondents ............................................................. 100
Table 4.11: Characteristics of respondents by their risk attitudes ....................... 100
Table 4.12: Market behaviour of respondents by location .................................... 105
Table 4.13: Selling channel choice of respondents by location ............................ 105
Table 4.14: Market behaviour of respondents by risk attitude ............................ 106
Table 4.15: Selling channel choice of respondents by risk attitude .................... 106