

TABLE OF CONTENTS

<i>ACKNOWLEDGEMENTS</i>	<i>iii</i>
<i>EXECUTIVE SUMMARY</i>	<i>iv</i>
<i>TABLE OF CONTENTS</i>	<i>xxi</i>
<i>ACRONYMS</i>	<i>xxiv</i>
<i>LIST OF FIGURES</i>	<i>xxv</i>
<i>LIST OF TABLES</i>	<i>xxviii</i>
<i>CHAPTER 1 INTRODUCTION</i>	<i>1</i>
<i>CHAPTER 2 NATURAL RESOURCE BASE OF THE STUDY AREA</i>	<i>6</i>
2.1 General	6
2.2 Climate	7
2.3 Vegetation	8
2.4 Soils	11
2.5 Water Resources	13
2.6 Land Use and Potential	13
2.7 The Study Sites	14
<i>CHAPTER 3 BASELINE SOCIO-ECONOMIC STUDY</i>	<i>22</i>
3.1 Background	22
3.2 The Problem	23
3.3 Research Objectives	23
3.4 Study Design	24
3.5 Methods	25
3.5.1 Focus group discussion (FGD)	25
3.5.2 Key informant interviews	25
3.5.3 Transect walks	25
3.5.4 Household survey	26
3.6 Results – Ntembeni	26
3.6.1 Demographics	26
3.6.2 Infrastructure	27
3.6.3 Household water and sanitation	28
3.6.4 Socio-economic profile of Ntembeni	28
3.6.5 Community activities	30
3.6.6 Land ownership and land use	31
3.6.7 Water supply and water use	32
3.7 Results – KwaMncane	34
3.7.1 Demographics	34
3.7.2 Infrastructure	35
3.7.3 Household water and sanitation	36
3.7.4 Socio-economic profile of KwaMncane	36
3.7.5 Community activities	37
3.7.6 Land ownership and land use	39
3.7.7 Water supply and water use	40
3.8 Discussion	41
<i>CHAPTER 4 THE EFFECT OF SELECTED WATER HARVESTING AND SOIL CONSERVATION TECHNIQUES ON SOIL WATER AND CROP YIELD</i>	<i>47</i>

4.1	Introduction _____	47
4.2	Materials and Methods _____	49
4.2.1	Automatic weather station _____	49
4.2.2	Soil physical properties _____	50
4.2.3	Soil water studies _____	53
4.3	Results and Discussion _____	66
4.3.1	Climate _____	66
4.3.2	Soil water studies _____	69
4.3.3	Plant growth (micro-catchment – Free Sate adopted method), May 2006 _____	83
4.3.4	Gravimetric soil water content (upper 0.15 m soil layer) _____	87
4.4	Conclusion _____	88

CHAPTER 5 APPLICATION OF WATER HARVESTING TECHNIQUES IN RANGELAND/LIVESTOCK PRODUCTION SYSTEMS _____ 90

5.1	Background _____	90
5.2	Baseline Survey _____	91
5.2.1	Methods _____	91
5.2.2	Results _____	93
5.2.3	Conclusion _____	96
5.3	Fodder Flow Experiment _____	98
5.3.1	Introduction _____	98
5.3.2	Methods _____	99
5.3.3	Results _____	101
5.3.4	Discussion _____	102

CHAPTER 6 SOCIO-ECONOMIC IMPACT ASSESSMENT _____ 103

6.1	Introduction _____	103
6.2	Methods _____	104
6.2.1	Framework of analyses _____	104
6.2.2	The social survey _____	104
6.2.3	Focus group discussions _____	105
6.2.4	Analysis and interpretation of data _____	105
6.3	Results and Discussion _____	106
6.3.1	Gender and age distribution of the respondents _____	106
6.3.2	Impact of the rainwater harvesting project on social status of households _____	106
6.3.3	Impact of the rainwater harvesting project on farmers' organisational structures _____	110
6.3.4	Impact of the rainwater harvesting project on surrounding communities _____	113
6.3.5	Impact of rainwater harvesting project on economic status of farming households _____	114
6.3.6	Effects of the rainwater harvesting project on household food security _____	116
6.3.7	Impact of the rainwater harvesting project on the farmers _____	119
6.3.8	Impact of the rainwater harvesting project on the surrounding communities _____	121
6.3.9	Impact of the rainwater harvesting project on the key buyers of vegetables _____	125
6.3.10	Uptake of water harvesting techniques by farmers _____	127
6.4	Conclusions and Recommendations _____	127
6.4.1	Conclusions _____	127
6.4.2	Recommendations _____	128

CHAPTER 7 CONCLUSIONS AND RECOMMENDATIONS _____ 129

APPENDIX 1 LITERATURE REVIEW _____ 134

1	Introduction _____	134
2	Rainwater Harvesting Processes and Design _____	136
3	Rainwater Harvesting Techniques in Various African Countries _____	141
4	Rainwater Harvesting in South Africa _____	149

