# Table of Contents

Summary 7

Samenvatting 11

1 Introduction 15
   1.1 Background 15
   1.2 Research objectives 20
   1.3 Outline of thesis 21

2 Evaluation of small scale water harvesting techniques for semi-arid environments 25
   2.1 Introduction 27
   2.2 Data and methods 28
   2.3 Results 33
   2.4 Discussion 40
   2.5 Conclusions 45

3 Potential for community based adaptation to droughts: Sand dams in Kitui, Kenya 47
   3.1 Introduction 49
   3.2 Case study: Kitui Kenya 50
   3.3 Data and methods 54
   3.4 Results 59
   3.5 Discussion and conclusion 64

4 Returns to water harvesting investments in semi-arid regions – A meta analysis 67
   4.1 Introduction 69
   4.2 Methods 70
   4.3 Results 75
   4.4 Discussion and conclusions 82

5 The role of small scale sand dams in securing water supply under climate change in Ethiopia 87
   5.1 Introduction 89
   5.2 Data and methods 91
   5.3 Results 103
   5.4 Discussion 109
   5.5 Conclusion and recommendations 113
# Community based adaptation in water management

6  A stepwise, participatory, approach to design and implement community based adaptation to drought in the Peruvian Andes  
   6.1 Introduction  
   6.2 Data and methods  
   6.3 Results and discussion  
   6.4 Overall discussion and conclusions  

7  Assessment of the effectiveness of flood adaptation strategies for HCMC  
   7.1 Introduction  
   7.2 Method and data  
   7.3 Results and discussion  
   7.4 Discussion of results  
   7.5 Conclusions  

8  Synthesis  
   8.1 How does this research contribute to the stated research questions?  
   8.2 Recommendations for further research  

9  References  

10 Appendices  
   Appendix A: Used literature for Table 2.3  
   Appendix B: Used literature for Table 2.5  
   Appendix C: Overview of the studies included in the database (Chapter 4)  
   Appendix D: STREAM model script (Chapter 5)  
   Appendix E: Results of validation runs (Chapter 5)  
   Appendix F: Downscaled precipitation projections (Chapter 5)  
   Appendix G: Downscaled temperature projections (Chapter 5)  
   Appendix H: Daily precipitation and the water levels behind a sand dam (Chapter 5)  
   Appendix I: Questionnaire and list of measures considered (Chapter 6)  
   Appendix J: General characteristics of the 94 households interviewed (Chapter 6)  
   Appendix K: Spearman correlation socio-economic factors (Chapter 6)  

Dankwoord  

About the author