

EGERTON UNIVERSITY LIBRARY

**AWARENESS AND RESPONSE BY SMALLHOLDER
WOMEN FARMERS TO SOIL EROSION: A CASE
STUDY OF NJORO, KENYA.**

by

Caroline Anyango

**A THESIS SUBMITTED TO THE GRADUATE SCHOOL, EGERTON
UNIVERSITY IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTERS OF ARTS (GEOGRAPHY)**

**FACULTY OF ENVIRONMENTAL STUDIES AND NATURAL
RESOURCES, EGERTON UNIVERSITY.**

X August 2000



Eger234189

Abstract

The debate on land degradation in Kenya is mainly concerned with management, or mismanagement of agricultural land given existing land tenure systems and population pressure. Soil erosion is a major land degradation concern on smallholder farms most of which are managed by women.

This study's broad objective was to assess smallholder women farmers awareness about soil erosion and analyse socio-economic factors, farm resources and farm management decisions that influence their response to soil erosion in Njoro division of Nakuru District. The specific objectives were: (a) to assess the extent to which smallholder women farmers are aware of soil erosion as a problem affecting farm productivity on their farms; (b) to identify the ways in which socio-economic factors (age, education and income), farm resources (farm size, family size and farming tools), farm management decisions and participation in group activities influence women farmers' response to soil erosion; (c) to identify soil conservation measures women opt for in dealing with soil erosion problems; and (d) suggest appropriate intervention measures that can be implemented to improve womens' contribution to soil conservation. The study hypothesised that there was no significant relationship between smallholder women farmers' response to soil erosion and their socio-economic factors, farm resources, farm management decisions and participation in group activities.

The study employed various techniques for gathering data. First, a sample of 100, consisting of 72 female and 28 male, respondents was interviewed using a questionnaire. The second method involved structured interview of eight key informants

while the third method involved discussions with groups of farmers. In addition, field observations of the main soil conservation structures and farm organisations were also done. Data was analysed using both descriptive (mean, variance, frequencies and standard deviation) and inferential (cross tabulation, correlation and regression analysis) statistics. Secondary data composed of documented information about the subject of women and their participation in agricultural development and specifically soil conservation.

The main findings of the study are threefold. First, women are aware of soil erosion as a serious environmental problem and associate soil erosion with decline in soil fertility and farm productivity. Second, awareness to soil erosion and experiences by women farmers influence their response to soil erosion problems. And third, socio-economic factors (education and income), farm resources (farm and family size) and farm decision-making as well as participation in work groups have important influence on womens' adoption of soil conservation measures.

Based on the study findings, three main areas of improving womens' contribution to soil conservation are recommended. First, soil conservation and rural afforestation programmes must address household preferences as well as women awareness and potential response in decision-making. Second, proper institutional and financial arrangements to encourage women farmers adopt more effective soil conservation measures will be important. Last, womens' participation in agricultural and rural development programmes and projects such as soil and water conservation should be recognised and improved by government, private sector and non-governmental organisations. Such initiatives can be channelled through women groups.

EGERTON UNIVERSITY LIBRARY

Table of Contents

APPENDIX	ii
DECLARATION.....	iii
ABSTRACT.....	iv
ACKNOWLEDGEMENTS.....	vi
DEDICATION.....	viii
TABLE OF CONTENTS.....	ix
LIST OF TABLES.....	xii
LIST OF FIGURES.....	xiv
LIST OF APPENDICES	xv
LIST OF PLATES.....	xv
LIST OF ABBREVIATIONS.....	xvi
CHAPTER ONE: INTRODUCTION	1
1.0 INTRODUCTION	1
1.1 CONTEXT OF THE RESEARCH PROBLEM.....	1
1.1.1 <i>An Overview of Agricultural Sector in Kenya</i>	1
1.1.2 <i>Soil Conservation in Kenya</i>	4
1.2 STATEMENT OF THE PROBLEM.....	7
1.3 STUDY OBJECTIVES	9
1.4 STUDY QUESTIONS AND HYPOTHESES.....	9
1.6 JUSTIFICATION FOR THE STUDY	11
1.7 RATIONALE FOR CHOICE OF THE STUDY AREA.....	12
1.8 SCOPE AND DELIMITATION OF THE STUDY	14
1.9 OPERATIONAL DEFINITION OF TERMS	14
1.9.1 <i>Farm Household</i>	15
1.9.2 <i>Soil Erosion, Conservation and Sustainable Agriculture</i>	15
1.9.3 <i>Social Relations</i>	16
1.9.4 <i>Women Heads of Households</i>	16
1.9.5 <i>Women Smallholder Farmers</i>	16
1.9.6 <i>Social Change</i>	17
1.10. ORGANISATION OF THE THESIS.....	17
CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL/ CONCEPTUAL FRAMEWORK	19
2.1 INTRODUCTION	19
2.2 REVIEW OF RELATED LITERATURE.....	19
2.2.1 <i>Women and Agriculture</i>	19
2.2.2 <i>Soil Conservation and Farmers' Perception</i>	21
2.2.3 <i>Women and Soil Conservation in Kenya</i>	27
2.2.4 <i>Soil Erosion and Conservation</i>	34
2.2.5 <i>Land Cover Changes and Soil Erosion in Njoro division</i>	37
2.2.6 <i>Women and Socio-economic changes in Kenya</i>	42
2.2.7 <i>Overview of Literature Review</i>	45
2.3 THEORETICAL/CONCEPTUAL FRAMEWORK	49
CHAPTER THREE: ECOLOGICAL AND SOCIO-ECONOMIC BACKGROUND TO SOIL EROSION IN NJORO DIVISION.....	61
3.0 INTRODUCTION	61
3.1 LOCATION AND SIZE.....	61

3.2 TOPOGRAPHY AND CLIMATE	64
3.2.1 Agro-Ecological Zonation of Njoro Division.....	68
3.2.2 Rainfall and Temperature conditions	70
3.2.3 Soils	74
3.4 POPULATION SIZE, DISTRIBUTION AND STRUCTURE.....	80
3.5 SOCIO-ECONOMIC PROFILE.....	83
3.6 SUMMARY	86
CHAPTER FOUR: STUDY METHODOLOGY.....	88
4.1 INTRODUCTION	88
4.2 DATA REQUIREMENTS, SOURCES AND TYPES.....	88
4.3 UNIT OF ANALYSIS	90
4.4 SAMPLING FRAME, DESIGN AND SAMPLE SIZE.....	91
4.4.1 Non-Probability Sampling	91
4.4.2 Probability Sampling	92
4.4.3 Sample Size	95
4.5 DATA COLLECTION PROCEDURES.....	96
4.5.1 Questionnaire Administration.....	98
4.5.2 Structured Interviews.....	99
4.5.3 Group Discussions	100
4.5.4 Observation.....	101
4.5.5 Field Facilities.....	102
4.6 LIMITATIONS OF THE FIELD RESEARCH	102
4.7 CONCEPTUALISATION OF KEY VARIABLES.....	104
4.8 DATA PROCESSING AND ANALYSIS	105
4.9 SUMMARY	106
CHAPTER FIVE: SMALLHOLDER WOMEN FARMERS PROFILE AND SOIL EROSION IN NJORO DIVISION.....	107
5.1 INTRODUCTION	107
5.2 SOCIO-ECONOMIC CHARACTERISTICS OF THE RESPONDENTS	107
5.2.1 Age.....	107
5.2.2 Education.....	109
5.2.3 Total Monthly Income Received.....	110
5.3 RESOURCE AVAILABILITY TO SMALLHOLDER WOMEN FARMERS	113
5.3.1 Farm Size	113
5.3.2 Family Size.....	116
5.3.3 Farming Equipment	117
5.4 SMALLHOLDER FARM MANAGEMENT AND PARTICIPATION IN GROUP	119
5.4.1 Decision-Making.....	119
5.4.2 Participation in Work Groups	123
5.5 SOIL EROSION PROBLEMS ON SMALLHOLDER FARMS IN NJORO DIVISION	124
5.6 ADOPTION OF SOIL CONSERVATION MEASURES BY SMALLHOLDER WOMEN	127
5.6.1 Extent of Women Adoption of Soil Conservation Measures	127
5.6.2 Factors Influencing Women farmers Contribution to Soil Conservation	131
5.6.3. Measures to Improve Women Farmers Contribution to Soil Conservation.....	134
5.7 SUMMARY	135
CHAPTER SIX: ANALYTICAL MODEL FOR HYPOTHESES TESTING	136
6.1 INTRODUCTION	136
6.2 WOMEN AWARENESS ABOUT SOIL EROSION AND CONSERVATION.....	136
6.3 DATA ANALYTICAL MODEL AND HYPOTHESIS TESTING	138
6.3.1 Specification of the Null and Alternative Hypotheses.....	138

6.3.2 Model Identification and Specification.....	140
6.3.3 Selection of Variables for Inclusion in the Model.....	142
6.3.3.1 Farm Size	142
6.3.3.2 Total Income received from the Farm	143
6.3.3.3 Decision-making	145
6.3.3.4 Family Size.....	146
6.3.3.5 Respondents' Experience with Soil Erosion	147
6.3.3.6 Smallholder Women Farmers' Participation in Work Groups	148
6.3.3.7 Farming Implement	149
6.3.3.8 Age	149
6.3.3.9 Education.....	150
6.3.4 The Regression Model	150
6.4 SUMMARY	158
CHAPTER SEVEN: WOMEN AWARENESS AND RESPONSE TO SOIL EROSION IN NJORO DIVISION.....	159
7.1 INTRODUCTION	159
7.2 WOMEN AWARENESS ABOUT SOIL EROSION	159
7.3 WOMEN RESPONSE TO SOIL EROSION.....	163
7.4 INFLUENCE OF FARM RESOURCES ON RESPONSE TO SOIL EROSION.....	173
7.5 INFLUENCE OF SOCIO-ECONOMIC FACTORS ON RESPONSE TO SOIL EROSION	178
7.6 INFLUENCE OF SOCIAL PARTICIPATION.....	185
7.7 ENVIRONMENTAL LAW AND WOMENS' RESPONSE TO SOIL EROSION	187
7.8 SUMMARY	192
CHAPTER EIGHT: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	193
8.1 INTRODUCTION	193
8.2 SUMMARY	193
8.3 FINDINGS	195
8.3.1 Evidence of Soil Erosion.....	196
8.3.2 Women Smallholder Farmers' Response to Soil Erosion.....	197
8.3.3 Factors Influencing Smallholder Women Farmers' Response to Soil Erosion	198
8.4 CONCLUSIONS	201
8.5 RECOMMENDATIONS	203
8.5.1 Policy Recommendations	203
8.5.1.1 Areas of Common Agenda	204
8.5.1.2 The Role of Women Scholars.....	205
8.5.1.2 Local and Foreign NGO's,.....	206
8.5.1.3 Role of the Government	208
8.5.2 Areas of Further Research.....	214
REFERENCES	215