INFLUENCE OF FORMAL EDUCATION ON RISK MANAGEMENT: EFFECTS OF INVESTMENT IN LIVESTOCK AND ASSET DIVERSIFICATION AMONG THE IL-CHAMUS COMMUNITY OF BARINGO DISTRICT: KENYA.

BY

LENACHURU CLEMENT ISAIAH

A Thesis submitted in partial fulfillment for the Degree of Master of Science in Natural Resources Management (Human Ecology) of Egerton University.

OCTOBER, 2002

EGERTON UNIVERSITY

NJORO, KENYA



EGERTON UNIVERSITY LIBRARY

Declaration

The work presented in this thesis is my original work and has not been submitted in this or any other form for award of degree in any university.

Clement Isaiah Lenachuru

Signature:_____

Date: 10/10/2002

Supervisors' Approval

This thesis has been submitted to graduate school with our approval as university supervisors

Prof. A.A. Aboud

Signature:_____

Date: 6-10-2002

Dr. P. K. Rono

Signature:_____

Date: 7/10/2002

EGERTON UNIVERSITY LIBRARY

©Copyright

No part of this thesis may be produced, stored in any retrieval system, or transmitted in any form or means; electronic, mechanical, photocopying, recording or otherwise without prior written permission of the author or EGERTON UNIVERSITY on that behalf.

©Lenachuru C.I.

Dedication

To

Christina, **Judith**, **Emma, Caleb** and **Violetta** born as I was writing this thesis.

Acknowledgements

My humble gratitude goes first and foremost to the Almighty God, who granted me this opportunity, and through whom I have been able to achieve all that I have.

This research would not have been possible without the support and contribution of many people. First I would like to thank Prof. Abdillahi A Aboud and Dr. Philip K. Rono, my main supervisors and Egerton University in general, for their encouragement and unlimited support, morally, and professionally over the period of this study.

Secondly I would like to thank Dr. Layne D Coppock and Dr. Peter D. Little for granting me the opportunity and financial support through The Global Livestock Collaborative Research Support Program (GL-CRSP) without which this research would have been very difficult to carry out and finish at the shortest time possible. I am deeply grateful to Dr. Little of University Kentucky who took exceptional interest in my study.

I also wish to express my sincere thanks to my colleagues in the Department of Natural Resources Management, Egerton University, for their moral support and assistance in academic work, which made my studies much easier. These include my course-mates for their support and constructive ideas throughout the entire course period. To all of you, thanks a lot.

To my wife Christina, children Judith, Emmanuella, Caleb and Violetta, I say thank for your support, patience and encouragement throughout the entire period of my studies.

Last, but certainly not least, my thanks go out to my research assistants: Jackson, Patrick, Thomson, Melina and Agnes. Their cooperation and assistance went a long way towards ensuring the success of the data collection exercise.

Abstract

Formal education has expanded into all parts of Kenya and more recently to the pastoral Il-chamus community of Baringo District. Considerable investment has gone into it in the form of livestock sales as people finance the increasingly expensive education. Education is a new concept to the Il-chamus Pastoralists and it is expected to prepare the pastoralists to manage environmental risks better. The main purpose of this study was to determine the influence of formal education on risk management as influenced by investment in livestock, assets diversification and income remittances among the Il-chamus. The study was carried out in Marigat Division of Baringo District in Kenya, between October 2000 and January 2001. Two groups of subjects used consisted of those herders who have some form of formal education and those that have none (illiterate). Two hundred and ten (210) herders were selected randomly from 3 locations in the division. The sample consisted of 73 women and 137 men. A survey questionnaire in the form of an interview schedule was administered to all of them. Six specific objectives were used to guide the study, from which 6 hypotheses were developed suggesting relationship between the dependent variable risk management, and three intervening dependent variables namely peoples' investments on livestock, assets diversification and income remittances and the independent variable, formal education. The data obtained from the study were analyzed using the Statistical Package for the Social Science (SPSS) programme, applying descriptive statistics to describe the variables involved, correlation and crosstabulations analyses to determine relationships between the variables, and t-test to determine differences between populations. The results suggested that there are significant positive relationships between formal education and peoples' ability to manage risks, through diversification of capital assets and investments in livestock management. Results suggested no relationships between formal education and breeds of livestock kept and diversification of species (nature of animal husbandry undertaken). Formal education is highly recommended to pastoral communities.

TABLE OF CONTENTS

Page

Declaration.....i

Copyright.....ii

Dedication.....iii

Acknowledgement.....iv

Abstract.....v

TABLE OF CONTENTS.....vi

LIST OF TABLES.....xi

LIST OF FIGURES.....xiii

CHAPTER ONE.....1

1.0 INTRODUCTION.....1

1.1 Background information.....1

1.2 Statement of the problem.....3

1.3 Study justification.....3

1.4 Objectives of the study.....4

1.5 Hypothesis of the study.....5

CHAPTER TWO.....7

2.0 LITERATURE REVIEW.....7

2.1 Introduction.....7

2.2 The general relationship between education and development.....7

2.3 Pastoral risk management.....8

2.4 Investing in People 9

2.5 Africa's Human Development Crisis 10

2.6 Do Africans value Investments in Human Development? 11

2.7 Education in the Development Plans: 1964-1988 12

2.8 The Aims of Education in the Development Plans 13

2.9 The Economic Objectives of Education 13

2.10 Education and the Community 14

2.11 Education and Herding in East Africa 14

2.12 Education and Socio-economic changes among the Maasai of Kenya 15

2.13 Education and Employment 16

2.14 Educational Development among Pastoralists in Kenya 16

CHAPTER THREE 22

3.0 RESEARCH METHODOLOGY 22

3.1 Study Area 22
3.1.1 Location and Size 22
3.1.2 Topography and Climate 22
3.1.3 Land and Soils 23

3.2 Research Site 24

MAP OF THE STUDY AREA (BARINGO DISTRICT) 25

MAP OF THE STUDY SITE 26

3.3 Study Population 27

3.4 Theoretical Framework 27
3.4.1 Education in Investment on Livestock 28
3.4.2 Education on Assets Diversification 28
3.4.3 Education on Home Investment 28
3.4.4 Education on Remittances 28
3.4.5 Education on Risk Management 29

EGERTON UNIVERSITY LIBRARY

3.5 The Conceptual Framework 29

3.6 Definition of Terms and Operationalization of Study Variables 30

3.7 Research Design and Sources of Data 34

3.8 Sampling Procedure 35

3.9 Sample Frame and Sample Size 35

3.10 Data Collection 36

3.11 Data Analysis 36

CHAPTER FOUR 38

RESULTS AND DISCUSSION 38

4.0 Introduction 38

PART I: DESCRIPTIVE ANALYSES 38

4.1 Socio-economic characteristics of the Il-chamus community 38
4.1.1 Age 38
4.1.2 Ethnicity 38
4.1.3 Sex of the respondents 38
4.1.4 Pattern of Household Headship 39
4.1.5 Primary Occupation 40
4.1.6 Location/ town of work 40
4.1.7 Education level of household heads 41
4.1.8 Family sizes 43

4.2 Herders Livelihood 44
4.2.1 Recovery period after a severe drought (1984/5 & 1999/ 00) 44
4.2.2 Restocking processes 44
4.2.3 Education and Occupation of persons in employment 46
4.2.3 Salary 47
4.2.5 Remittance 48
4.2.6 Use of remittances 49
4.2.7 Remittance regularity 50
4.2 8 Decision making on the use of remittances 51

4.3 Households sources of income 51
4.3.1 Salary/ Wages 51
4.3.2 Other major sources of Income to the households 52

4.4 Total Household Income from the various sources 57

4.5 Household annual expenditures 58

4.6 Livestock Diversity, Dynamics, Quality and Management 60
4.6.1 Livestock species diversity 60
4.6.2 Livestock Dynamics 61
4.6.3 Livestock quality 61
4.6.4 Livestock management 62
4.6.5 Season of selling livestock 64

4.7 Analysis of household Assets 65

4.8 Area/ Geographical location of investment 68

4.9 Analysis of Risks/ Uncertainties Faced by the Herders 69

4.10 Risk Management Options as employed by Pastoralists 70

4.11 Common Sources of Food during times of crisis like during Drought 72

4.12 Remedies taken after the risk period to ease their negative impacts 73

4.13 Analysis of Socio-economic status of the respondents/ community 74

PART II: ANALYTICAL RESULTS AND HYPOTHESES TESTING 75

4.14 Association between Formal Education and Assets Diversity 76

4.15 Relationship between Formal Education and Quality of Livestock 77

4.16 Relationship between Formal Education and Total Livestock kept 78

4.17 Relationship between Formal Education and Expenses on Management 79

4.18 Relationship between Formal Education and Risk Management 80

4.19 Relationship between Direct income, Remittances and Risk Management 81

4.20 Sample means levels of herders with Formal Education and those without in Assets Diversification and Livestock Management 83

CHAPTER FIVE 85

5.0 SUMMARIES, CONCLUSIONS AND RECOMMENDATIONS 85

5.1 Summaries and Conclusions 85

5.2 Recommendations 87
5.2.1 Education 87
5.2.2 Livestock Investment 87
5.2.3 Assets Diversification 88
5.2.4 Remittance 88
5.2.5 Risk Management component 89

5.3 Future research 89

REFERENCES 91

APPENDIX 1. SURVEY QUESTIONNAIRE 97

LIST OF TABLES

Table1: Distribution of household heads by Gender 39
Table 2: Distribution of Respondents engaged in various occupations. 40
Table 3: Distribution according to location in wage employment. 41
Table 4: Numbers and Percentages of respondents who have attained various categories of Education level by gender 42
Table 5: Number and percentages of respondents in various categories of Family sizes. 43
Table 6: Numbers and percentage of respondents according to their Sources of cash for restocking 45
Table 7: Reasons why herders undertake restocking after serious losses 46
Table 8: Number and Education level of persons in labor market 46
Table 9: Number and occupation of various respondents in labor market 47
Table 10: Distribution of herders as per wages income groups 47
Table 11: Remittance distribution levels in Kshs 49
Table 12: Summary uses of Remittances 50
Table 13: Regularity of remittance received 51
Table 14: Distribution of salary incomes by groups 52
Table 15: Distributions summary of major household income sources 55
Table 16: Total household income distribution from varied sources 57
Table 17: Annual household expenses on various obligations 59
Table 18: Livestock ownership in various classes 60
Table 19: Livestock Dynamics in a year before and after Drought 61
Table 20: Relationship between formal education and breeds of cattle kept 62
Table 21: Yearly expenditure on livestock management 63
Table 22: Labor division in herding in the household 64
Table 23: Selling Time of Stock 65
Table 24: A count on key household assets 66
Table 25: Investment into capital assets 67
Table 26: Relationship between formal education and location of asset 69
Table 27: Distribution of Risks/ Uncertainties as faced by Herders 70

Table 28: Common Sources of Food among the Households 72

Table 29: Qualitative Socio-economic Indicators 74
Table 30: Quantitative Socio-economic Indicators 75
Table 31: Variables Entered 75
Table 32: Matrix for Pearson Correlation coefficients (r), 2-tailed sig. 76
Table 33: Association of Formal Education and Assets diversity 77
Table 34: Association of formal education and quality of livestock kept 78
Table 35: Association between Formal Education level and Total Livestock owned 79
Table36: Association of Formal Education and Expenses level on Livestock Management 80
Table 37: Association between Formal Education and Risk Management 81
Table 38: Association between wages income to the household and risk management ... 82
Table 39: Association between Households that receive remittance and Risk Management 82
Table 40: Analysis of means comparison in Livestock Management (One sample test).. 83
Table 41: Analysis of the means comparison on Assets Diversification (one sample test) 84

LIST OF FIGURES

Figure 1: Conceptual Model 30

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Written and oral histories point to the presence of a Maa-speaking group, the Ilkeroi, inhabiting Lake Baringo area prior to the Il-chamus (Dundas, 1910). They were there by at least the late eighteenth century, since around that time Uasin Gishu Maasai refugees of the war between the Maasai and Loikop are said to have joined the community at Lake Baringo (Vossen 1978; Weatherby 1967). Further evidence of an early Uasin Gishu connection is corroborated by the migration pattern of the Ilkeroi after they were dispersed. Elders note that many of them resettled on the Uasin Gishu plateau. While the ethnic origin of this earlier group is not known, they are likely to have had strong ties to the Kalenjin (i.e. Okiek), besides the Uasin Gishu Maasai. Their reliance on hunting and fishing and their lack of cattle suggest comparisons between them and such Maa-speaking hunters and gatherers as the IlTorobo (Ndorobo). Those families who claim Ilkeroi heritage are distinguished today from the general Il-chamus population, and are referred to locally as the 'true' Il-chamus (Little, 1992).

The Il-chamus of Baringo District, Kenya, provide a particularly interesting case of pastoral change that allows a local-level interpretation of an African 'crisis'. Early explorers and administrators frequently referred to the Il-chamus as the 'agricultural Maasai' until they begun to accumulate cattle herds comparable to those of other pastoral groups (Little, 1992).

Since the 1880's the Il-chamus area, in contrast to many parts of the northern Kenya, has been perceived as a location of exceptional agricultural potential- an area capable of

producing anything' (Thompson, 1885) and "the most fertile part of the eastern area of the province" (Colony and Protectorate of Kenya [CPK], 1926). The location is frequently referred to as a potential "granary" (an area capable of producing any type of food) and this view has shaped the state relationships with the community. Initially it was the governments and military ally, but later it was undermined by government policies. Since the 1920's most droughts and famine in Il-chamus (and generally in Baringo) have been associated with punitive state policies, the most serious of them being market related (Little, 1992).

In the last three decades of this century, formal education has penetrated into this community, although not all of them have acquired it, more so the older generations. There are still groups, which did not get formal education at all. Considerable investment has gone into this in the form of livestock and other assets sold to finance the increasingly expensive education. The rapid quantitative expansion of education and the attempts to maintain quality in education institutions have had enormous financial implications for the government and the public (Otiende *et al,* 1992). By 1984, the government, under the philosophy of sharing costs, had washed its hands off almost all current expenditure on primary education except paying teachers' salaries. Parents were by 1990 buying all books and texts, apart from meeting all the developmental costs. It was found out that it was not easy to compute massive community contributions to education. For example, in two public fund raisings (*harambees*), one for Murang'a and another for Kisii primary schools in 1983 are known to have respectively raised Kenya shillings (Ksh.) 17 million and Ksh. 43 million.

1.2 Statement of the Problem

Formal education presently among the Il-chamus is well spread although it was taken at first with much hostility. This education, apparently, influences them in the level of investment on livestock and also in their diversification of assets as a strategy for facing various risks and uncertainties associated with the hostile environment. It is not clear how the formal education influences them, and the magnitude of the same is not documented. Studies related to this problem have been done among the Maasai and Rendille but not the Il-chamus community (Holland, 1996). This study seeks to find out how formal education influence investment on livestock and diversification of other assets. It also examined coping strategies, location of investment of remittance, the level of remittances, and compared the socio-economic status of educated households and non-educated households. Formal education can be considered as a form of investment that can mitigate the risks/crisis (Little 1992), faced by the pastoralists in the arid and semi-arid lands of Baringo District.

1.3 Study Justification

The Il-chamus were chosen because they have had a good access to education facilities since the late 70's onwards and serious climatic changes have taken place within the same periods. This led to loss of livestock in great numbers (their major economic base), and at the same time many children acquired formal education.

The study tried to find out the influence of formal education in investment on livestock in improving their diversity, quality and quantity. Influence on the diversification of assets

and investment in variety of assets was looked at. These factors are important because they lead to improvement on the economic quality of the life of the pastoralists and make it more stable.

The study was set to find out how formal education has assisted the herders to cope better with risks/ disasters. This is one major problem that faces all pastoralists worldwide and if research can provide a solution to them, then great change will be seen in the pastoralists' economy. Remittances from those working in urban areas to the family members and relatives who financed the formal education will help them and ease the stress that is accompanying the risks of drought and famine. It is hoped that through this study, appropriate and relevant information will be generated. The findings will enable policy makers to appreciate the desire to assist the pastoral communities so that they can live an economically viable life for their general contribution to the national economy cannot be ignored, especially through the beef industry.

1.4 Objectives of the study

The objective of this study was to determine the influence of formal education on risk management through the effects of investment in livestock and assets diversification among the Il-chamus community of Baringo district. The following objectives were used to guide the study:

Broad objective:

To determine the influence of formal education on dependent variable risk/crisis management as influenced by investment on livestock and assets diversification.

Specific objectives:

1. Determine and describe the influence of formal education on investment in livestock.

2. Determine and describe the influence of formal education on herders' diversification of assets.

3. Determine and describe the influence of formal education on investment in non-livestock assets.

4. Determine the remittances to the emigrant original homes and their uses.

5. Determine and describe the influence of formal education on coping with the risks and disasters such as droughts that may occur from time to time.

6. Carry out comparative study on how formal education has influence the socio-economic status of educated households and the non-educated households.

7. Make recommendations and applications based on findings of this study to decision-makers/ policy makers on the way forward.

1.5 Hypotheses of the study

In order to meet the above mentioned objectives, the following five null hypotheses were developed.

1. (a) H_0: Formal education does not influence investment in livestock in terms of different classes, types and numbers of livestock.

1. (b) H_0: formal education does not influence the level of expenditures in livestock management.

2. H_0: There is no significant relationship between formal education and assets diversification.

3. H_0: There is no significant association between formal education and non-livestock assets investment.

4. H_0: There is no significant relationship between formal education and income remittance received by the original household of the emigrant person with risk coping mechanisms.

5. H_0: There is no significant association between formal education and ways in which herders cope with risks.

6. H_0: There is no significant difference between educated and non-educated households in terms of socio-economic status.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

The word 'education' points to both the individual and social development processes which cause a person's intellectual, emotional, spiritual and physical abilities to mature, thus enabling him to fully participate in community affairs (Otiende *et al*, 1992).

'Formal education' as used in this thesis refers to institutionalized learning. Its goals are specifically stated, the curriculum well defined, and it takes place within a definitive venue and duration. Learning is imparted by clearly identified instructors and learners are aware of the education process. 'Informal education' on the other hand, is not structured. Learning takes place subconsciously through the processes of observation, imitation and participation in daily activities. There is no recognized instructor.

In its broadest sense, 'education' is an all-inclusive process, save for those aspects that are simply genetic, that contribute to the formation of an individual's mind, character and physical development (Otiende *et al*, 1992). Time has shown that there are solutions to the problems of improving the system of education with a well-informed approach as to what has been tried out and with what degree of success or setbacks.

2.2 The General Relationship between Education and Development

The principal thesis that has dominated the literature in this area is that education is crucial factor (or even precondition) for development since it promotes economic growth

and enables the socialization of new members of society into the dominant and cultural value system (Webster, 1990).

The sociology of education in the West has been heavily influenced by a functionalist view, which sees education as the provider of basic skills, such as literacy and numeracy, and the most specialized technical knowledge that modern methods of production and management demand. In addition, the reward system that structures educational careers is said to encourage a strong commitment towards self-discipline, hard work and achievement, attitudes which are not only conducive of educational success but also industrial productivity and innovation.

2.3 Pastoral Risk Management

Risk and uncertainty in pastoral systems arise from many factors such as drought, market fluctuations, insecurity, theft and diseases (Moris, 1988; Galaty and Johnson, 1990). Severe drought and fluctuations in marketing conditions are two major sources of risk among the pastoralists in Kenya. Drought is the most prevalent and least manageable source of risk for livestock loss in the pastoral system.

Pastoralism is a high return and a high-risk business. When there is adequate rainfall, plenty of forage, peace and no disease epidemics, the pastoral economy can be attractive and profitable. But when times are bad, pastoralists risk losing a large proportion of their livestock assets (Coppock, 1994; Helland, 1997). The Borana of southern Ethiopia have social sharing and mutual assistance mechanisms that also serve as risk-spreading tools among households, communities and clan members (Helland, 1997).

2.4 Investing in People

Investing in people is becoming more important for two reasons. First, Africa's future economy growth still depends on its natural resources, which are being depleted and are subject to long-run price declines, and more on its labor skills and its ability to accelerate a demographic transition. Growth in today's information-based world economy depends on flexible, educated, and healthy workforce to take advantage of economic openness.

Second, investing in people promotes their individual development and gives them the ability to escape poverty. This again requires education and health care as well as some measure of income security.

Africa's households and governments have invested heavily in human development since independence. By the 1980s this investment had started to pay off in much improved human development indicators. But in the last 10- 15 years of the 20th century (ADB/ AERC/ GCA/ UNECA and WB, 2000) these indicators, still lagging behind those of other regions, started to stagnate or even decline.

Investing in people (food, health, and education), that is, the formation of human capital plays a central role. Empirical studies show a clearly positive correlation with economic growth. Thus, for instance, the worldwide gap in per capita income points towards a clear link with the differences in the duration of schooling. In a world in which simple skills are being increasingly overtaken by machines and in which state-of-the-art communication and information technologies penetrate the work process, investing in human capital is at least as important as investing in real assets (Kennedy, 2000).

Estimates by Oxfam (2000) suggest that the cost of achieving good quality universal primary education in sub-Saharan Africa will amount to around $ 3.6 billion per annum

for 10 years. Under the proposed compact, governments in the region would mobilize around $ 1.6 billion, or the equivalent of 0.5 per cent of Gross Domestic Product (GDP). For its part, the international community would mobilize around $ 2 billion through a combination of increased aid and debt relief under the Heavily Indebted Poor Countries (HIPC) initiative. This finance will ensure that primary education goals can be addressed, but additional funding will be needed to expand free and universal access to quality education at least to the age of 15 and to achieve at least a 50 % reduction in the number of adult illiterates (Action Aid/ Oxfam, 2000).

The human and economic costs of failing to tackle head-on the education crisis in sub-Saharan Africa will be immense- and they will be transmitted across generations. Universal access to good quality basic education is not only a fundamental human right in itself, but also a means to wider human development ends (Action Aid/ Oxfam, 2000).

Significant improvements in education will generate self-reinforcing benefits for human development. More rapid and more equitable economic growth will reduce income poverty, while at the same time generate the resources needed to increase public investment in priority social services. Similarly, the health benefits associated with education will include lower population growth and more investment in the growth and development of each child (Action Aid/ Oxfam, 2000).

2.5 Africa's Human Development Crisis

So high has been the growth of the school-age population that African countries have had trouble keeping enrollment rates constant. Africa is the only region where primary enrollment rates were lower in 1995 than in 1980. Though there were improvements in

the late 1990s, the primary enrollment rates of 1980 have not been reattained for boys or girls. Enrollment rates at all levels are far behind those in other regions.

Lower primary enrollments seriously undermine economic growth and poverty reduction. Worldwide, no country has enjoyed sustainable economic progress without literacy rates well over 50%. The content and quality of African education are also in crisis. At the primary level the regular assessment of student achievement remains rare. The assessments that exist are not encouraging, however poor quality not only produces poorly educated students, it also results in excessive repetition and low completion rates at enormous cost (ADB/ AERC/ GCA/ UNECA and WB, 2000).

2.6 Do Africans value Investments in Human Development?

It is sometimes suggested that African households do not invest in human development, especially education, because the private returns to that investment are not high to justify it. The evidence on private returns to education in Africa is mixed and somewhat dated. But it appears that market wage returns are usually high, as elsewhere in the world, especially for postprimary education. There is considerable controversy about the absolute size of the returns to education in Africa. Psacharopoulos, (1994), for instance, aggregates the private returns to primary education at 41%, to secondary education at 27% and to higher education at 28%.

Even studies that control for bias, however, find substantial private returns to education in Africa, in the order of an 8- 10% increase in wages per year of schooling (van der Gaag and Vijverberg, 1978). These data are largely static. Unresearched in modern Africa is the key question of whether returns to skills are rising because of increasing demand or

declining because of increasing supply (Knight and Sabot, 1990), whatever the precise numbers, the private returns to schooling are significant in Africa- suggesting that households should want to invest.

This quantitative evidence is strongly supported by anecdotal evidence. In many countries the buildings erected through voluntary effort for primary and secondary education, for local training centers, and for health clinics attest to the willingness of households and communities to invest in the future of their children. Outlays on school fees, uniforms, and the like account for a substantial claim on households' cash income (Fine *et al*, 1999). Given the poor and declining quality of education offered to many poor households, their continued willingness to forgo a considerable share of current consumption provides unambiguous evidence of a strong desire to invest in their children's future.

Strauss (2000) has summarized the evidence on household and community factors affecting investment in human developments in Africa. Households investment is largely determined by the education of the parents, by household income, and by income responses (at least for health care).

2.7 Education in the Development Plans: 1964-1988

Otiende *et al* (1992) observes that since achieving independence in 1963, Kenya has had eight successive development plans. The Kenya constitution, the 1963 election manifesto of the Kenya African National Union (KANU) and sessional paper No. 10 of 1965 on *African Socialism and Its Application to Planning in Kenya* form the basis for the first five Development Plans. The sessional paper No.10 outlines the basic objectives for an

independent Kenya. It also proposes the ways to achieve the objectives of freedom from want, disease, ignorance and exploitation, as well as individual freedom. The objective further includes an expansion of the economy with equitable sharing in its benefits and the integration of the national economy. The paper perceived education as more of an economic than a social service... the principal means for relieving the shortage of domestic skilled manpower and equalizing economic opportunities among all citizens. This basic principle, linking education to economic growth, was incorporated in all the development plans.

2.8 The Aims of Education in the Development Plans

Since independence, the general aims of education have been three-fold viz. first, the expansion of educational opportunities; secondly, the production of high level manpower; and thirdly, the promotion of national unity. As a first step towards achieving equal opportunities in education for all Kenyans, the Kenya government set upon itself the long term objective of providing Universal Primary Education (UPE). As early as the first development plan (1964-1970), UPE was identified as one of the major long-range objectives of Kenyan's educational programs (Otiende *et al*, 1992).

2.9 The Economic Objectives of Education

The linkage of education to economic growth has been a distinctive characteristic of the post-independence development plans in Kenya. Amongst the economic objectives of education are: the production of skilled manpower; the integration of the bulk of the

populace into rural areas, mainly in the agricultural sector; and the leveling of income disparities through the equitable distribution of both the resources and the benefits of economic development. These objectives were to be achieved through the provision of formal education as well as the technical and vocational education throughout the country with emphasis on secondary and higher level of education. The 1964-1970 development plan was particularly concerned with the role of education as a supplier of middle and high level skilled manpower needed to sustain economic growth (Otiende *et al*, 1992).

2.10 Education and the Community

According to Bray *et al*, (1986), formal education can help the community by giving its children skills in literacy, numeracy and other subjects. At the secondary level, the formal education provides access to income generating employment. Even if young people have to go to other places to take up jobs, they may help the communities by sending back money.

2.11 Education and Herding in East Africa

Among the pastoral communities, children look after cattle on a full time basis thus denying them a chance to go to school. Kituyi (1990) notes that in group ranches in Maasai land, children (especially boys) are withdrawn from school in order to move with livestock in search of water and pasture during the dry season. Writing about the Barabaig pastoralists of Tanzania, Kjaerby and Baynit (1979) observe that "... children in pastoral societies are heavily and continuously engaged in herding, day in day out." Rigby (1980) speculates that this engagement in herding could explain the pastoralists'

reluctance to send children to school, and he recommends that it should be researched into so as to understand its long time consequences.

2.12 Education and Socio-economic changes among the Maasai of Kenya

Knoczacki (1978) observes that though education is recognized as a stimulant for Socio-economic change, its provision among Africa's nomadic pastoralists is particularly difficult. This he explains, is often reinforced by the poor approach accorded to development issues among pastoralists. He gives the example of the consistent disregard of the pastoral people's own knowledge and know-how as a factor that reinforces this difficulty. Sena (1986) observes that ".... The Maasai's low level of educational attainment has put them at a serious disadvantage vis-a vis other Kenyan societies..... in claiming the political and economic benefits which development planning promises.

The writers of the District Development Plan 1979-1983 suggested that the principal obstacles in the path of increased school participation among the Maasai were the problem of tradition coupled with ignorance and misconceptions in that the parents do not understand why a child should go to school instead of looking after the cattle. Moreover, looking after the cattle brings in quicker returns than the prolonged educational investment, which is not pertinent to rearing livestock. This becomes more realistic to them since primary education is hardly geared to local needs of the nomadic life. ...There is the problem of apathy and unreadiness to change quickly. Lastly, there is the question of moranhood, which tends to distract children from schools (1980: 58-59).

2.13 Education and Employment

Holland (1992) observes that Education and wage-employment are becoming more critical to the future of many pastoralists as they diversify their options in the face of decreasing land available for pastoralism. It is clear from the previous studies (Holland 1996) that the traditional livestock economy alone cannot support the Maasai, nor for that matter the district population, and thus economic diversification in the district and for households is imperative and is, fortunately occurring. Given the need for cash and the inability of the livestock economy to sustain the population, the question of what role education plays in opening up wage-employment options for the Maasai is an important one to be addressed. According to Holland (1992), a key important question to be addressed is whether or not the different forms of wage or self-employment being pursued, and therefore economic diversification, imply a shift from the livestock-based economy of the district. This question is extremely important since Maasai society is not so easily described as it once may have been. The Maasai are no longer simply pastoralists, "people with cattle". They do many things that often appear to have no connection to pastoralism or to the pastoralist ideal in any meaningful sense. Increasing school participation has had an important impact on the Maasai way of life; on those who go to school and on their families and communities.

2.14 Educational Development among Pastoralists in Kenya

Education:

Since independence, education facilities have expanded rapidly at all levels.

This has been the case for both primary and secondary levels. However, the development has not been equally distributed throughout the whole country.

In 1969, 30% of the population above 20 years of age had been enrolled for some kind of formal education. However, some districts were far behind that average. This was particularly so within the dominantly pastoral districts including. Garissa (%), Mandera (1%), Wajir (4%), Samburu (4%), Turkana (12%), Marsabit (6%) and Isiolo (12%) (Narman, 1990).

Ten years later, approximately half of the Kenyan 20 years olds and above had at least entered some kind of formal schooling. However, predominantly pastoral communities were far behind the national averages. Especially this so for the districts with the highest proportion belonging to the nomadic groups, that is, .the following percent of Kenyans twenty years old and above have enrolled in some kind of formal education- Garissa (7 %), Mandera (4%), Wajir (4%), Marsabit (7%), Samburu (10%) and Turkana (6%) (Narman, 1990).

Obviously, districts with the highest dominance of pastoralism still have a very low share of people with some kind of formal education. In most parts of Kenya, an absolute majority of all children are at least enrolled in primary school. However, for the predominantly pastoral districts, the situation is a lot gloomier. For the districts of Wajir (10%), Garissa (10%), Mandera (11%), Turkana (13%), Samburu (23%), and Marsabit (24%) of the children were even enrolled for formal schooling (Narman, 1990).

The benefits of education are well known and well documented. Education improves productivity, directly contributing to economic development (Noor, 1981).

Livestock Investment and Risk Management:

Livestock production is a major activity for the people of Baringo District where they rear cattle, goats and sheep and donkeys and camels are also reared in East Baringo (Republic of Kenya 1997). The Il-chamus are predominantly pastoralists with limited crop agriculture. The commonest explanation to this is that most Il-chamus were herders by inclination but farmers out of necessity (Little, 1992). They maintained a preference for Pastoralism over agriculture even during the irrigation era, awaiting an opportunity to return to livestock production (Huntingford, 1953; Thom, 1978). A closer look at the economics of pastoralism versus agriculture, the returns to labor, the scarcest factor of production, are significantly higher for livestock than for grain production. A producer faced with such a choice would opt for livestock production, or if it were possible a combination of pastoralism and grain production, with the later providing cereals for subsistence. High capital and labor requirements for irrigated grain and livestock production restricts the investment options of poor homesteads, while increasing those of the rich (Little, 1992). Immediate destitution is a risk that every herdsman faces several times in his life. Pastoralists in East Africa and elsewhere have devised a variety of strategies for dealing with such a calamity (Widstrand, 1975).

a) *Herd diversification* - is one such strategy. It is based on the idea that camels and cattle; goats, sheep and donkeys (partly because of their different grazing habits) occupy different niches in the ecological community, and have different chances of survival.

Movement of herds – as a strategy for survival, and the pastoral peoples show all kinds of different migration patterns, from the simple, seasonal, short distance transhumance to long distance disaster migrations.

b) *Fall-back activities* - include agriculture and hunting. In time of need, dependence on these activities increases. Increase reliance on the money sector of the economy, or use of both economies simultaneously, are other fallback measures that may be taken.

c) *Storing food* - is a classic way for people with a subsistence economy to protect themselves from seasonal shortages. Pastoralists usually store food on the hoof and others thus may seem to have more animals than they need to survive.

Assets diversification:

The relationships among rural production, nonfarm income, and investment preclude simplistic characterization.

Diversification into non-farm activities, especially wage employment, is a response to low production among the poor and the need to diversify among the rich. Looking beyond the herd shows that nonfarm activities can improve the welfare of certain producer groups while jeopardizing the viability of others. At the lower end of the wealth continuum, pastoralists take on wage employment and dryland agriculture to supplement meager livestock income and to meet subsistence costs, while at the upper end, nonpastoral activities are pursued as accumulation strategies that serve to differentiate further the rich from the poor (Little, 1992).

Why do homesteads pursue other assets like agriculture if returns to labor are low - even lower than in livestock production? One important reason is that other assets can have a positive effect on livestock investment, which achieve better returns than other economic

activities chosen. These other assets may assist in purchase of more livestock from their profits and preserve herd capital by selling few animals than would otherwise be necessary. This strategy is pursued mostly by educated-headed households.

Home remittances:

Investments in education is often regarded as essential for economic development, which implies that such investments have high returns to the individual, family and relatives (Noor, 1981). This research examines the usefulness of formal education on the ability of the pastoralists/ herder to face risks and uncertainties associated with drought, livestock investment and assets diversification.

How are the returns from the years of formal education being distributed in the family and relatives? This is of particular importance because if education were like any other private investment goal, there may not be any economic rationale for its being financed by other relatives. Yet, most education is provided or heavily supported by the relatives. One economic argument for relatives support of education is that the benefits of one individual's education may accrue to other persons, that is, there may be externalities.

The potential benefits of education as a consumption good and source of pleasure cannot be separated from its utility in transmitting the skills necessary to help people meet their basic needs, such as health, adequate nutrition, safe-drinking water and housing and for raising income (Noor, 1981).

Formal education in the selected site as in many parts of the country grew out of a popular belief in the existence of a positive correlation between the educational level and socioeconomic performance of the society/ community over a period.

A number of assumptions are now taken for granted (Ishumi, 1994).

i) Education is an investment in human capital, it accounts for increased earnings and material well-being in a society, thereby increasing its socioeconomic health

ii) Education contributes broadly to capital formation and national material wealth

iii) An increased level of formal education, enhances the creative powers, innovative and productive capacities of individuals in society and hence the pace of social change.

[illegible] UNIVERSITY [illegible]

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Study Area

Under this section, research district area is looked in terms of its geographical location, size, topography and climate, soils and land in general shall be discussed in brief.

3.1.1 Location and Size

Baringo District is one of the seventeen districts in Rift Valley Province in Kenya. It borders Turkana district to the north, Samburu and Laikipia districts to the east, Koibatek to the south, and Keiyo, Marakwet and West Pokot districts to the west. The district covers an area of 10,594 sq. Km of which about 140 sq. km is covered by surface water. The district is about 210 km in length (N-S) and 100 km in breath (E-W). Marigat Division (research site) covers an area of 1,226 sq. km (see page24).

3.1.2 Topography and Climate

The major topographic features in the district are river valleys and plains, the Tugen Hills, the floor of the Rift Valley and the northern plateau. One of the prominent river valleys is the Kerio Valley. In the eastern part of the District are Lakes Baringo and Bogoria. The lacustrine salt-impregnated silt deposits cover the Loboi plain. The Tugen hills in the southwest part of the district form a conspicuous topographic feature in the district. The altitude varies from 1000 m to 2600 m above sea level.

Baringo district is one of the arid and semi-arid districts in the country with much of the district receiving low to average annual rainfall. However, within the district there are some high potential area neighboring the hills and the highlands that receive high rainfall. The district experiences two seasons of rainfall; the long rains start from the end of

March to the beginning of July, and the short rains from the end of September to November. The rainfall is about 50% reliable. It varies from 1000 to 1500 mm in the highlands to 600 mm in the lowlands in the northeastern part of the district.

The mean annual maximum temperature in the district lies between 25^0 and 30^0 Celsius in the southern part. In the northern part, the mean annual maximum temperature is about 30^0 and occasionally rises to over 35^0 C. the hottest months are from January to March. With this kind of climate, especially in the lowlands, the situation represents a hardy condition both to livestock and to crop producers. This poses a great risk to herders, where drought prevails longer periods than otherwise. Both erratic and unreliable rainfalls coupled with high temperature leads to situations where vegetation cover is virtually non-existent for eight to nine months of the year. One very striking feature of the vegetation in semi-arid Baringo is the complete lack of ground cover away from the swamps. Although immediately after the rains there is often good growth of ephemeral herbs, they quickly die back. To livestock production there are many risks associated with this kind of climate. This therefore makes livestock investment a very unstable, risky and unpredictable activity.

3.1.3 Land and Soils

The district can be divided into two major zones: the highlands and the lowlands. The highlands fall in the tropical zone. They have well drained fertile soils that have high potential for agricultural activities and improved livestock development.

The lowlands are in the semi-arid climatic zone with complex soils of various textures and drainage conditions that have developed alluvial deposits. Some of these soils are saline. This zone is essentially a rangeland with major socioeconomic activities centering

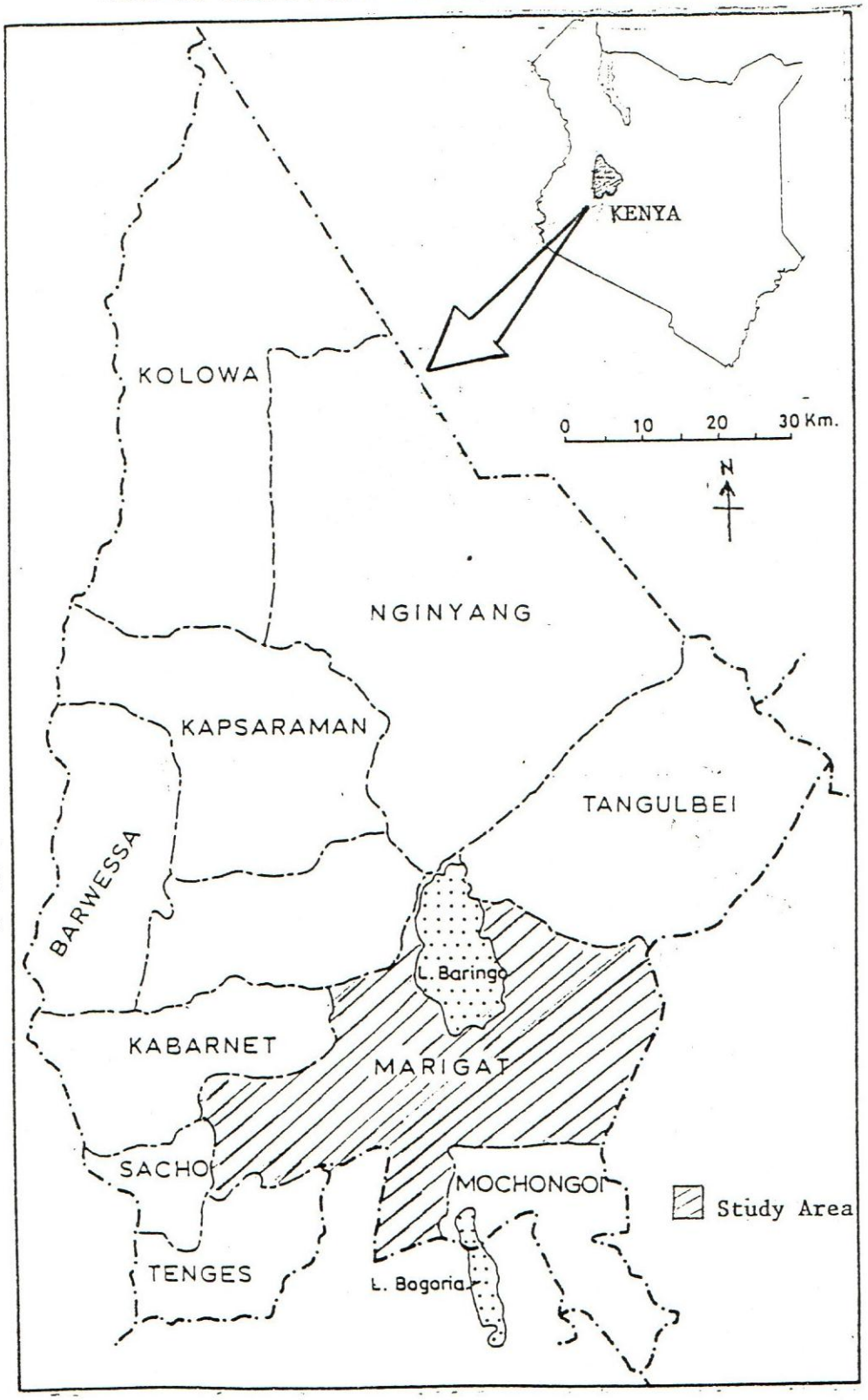
on beekeeping and livestock rearing. In Marigat division, subsistence agriculture and small-scale irrigation farming are also practiced.

Arid and Semi -Arid lands (ASALs) have long been less favored by both nature and states. Not only are soils quality and rainfall lower on average and more variable than in high potential zones, but these areas also suffer a lower density of public physical and institutional infrastructure (Ruminations, 1998).

3.2 Research Site

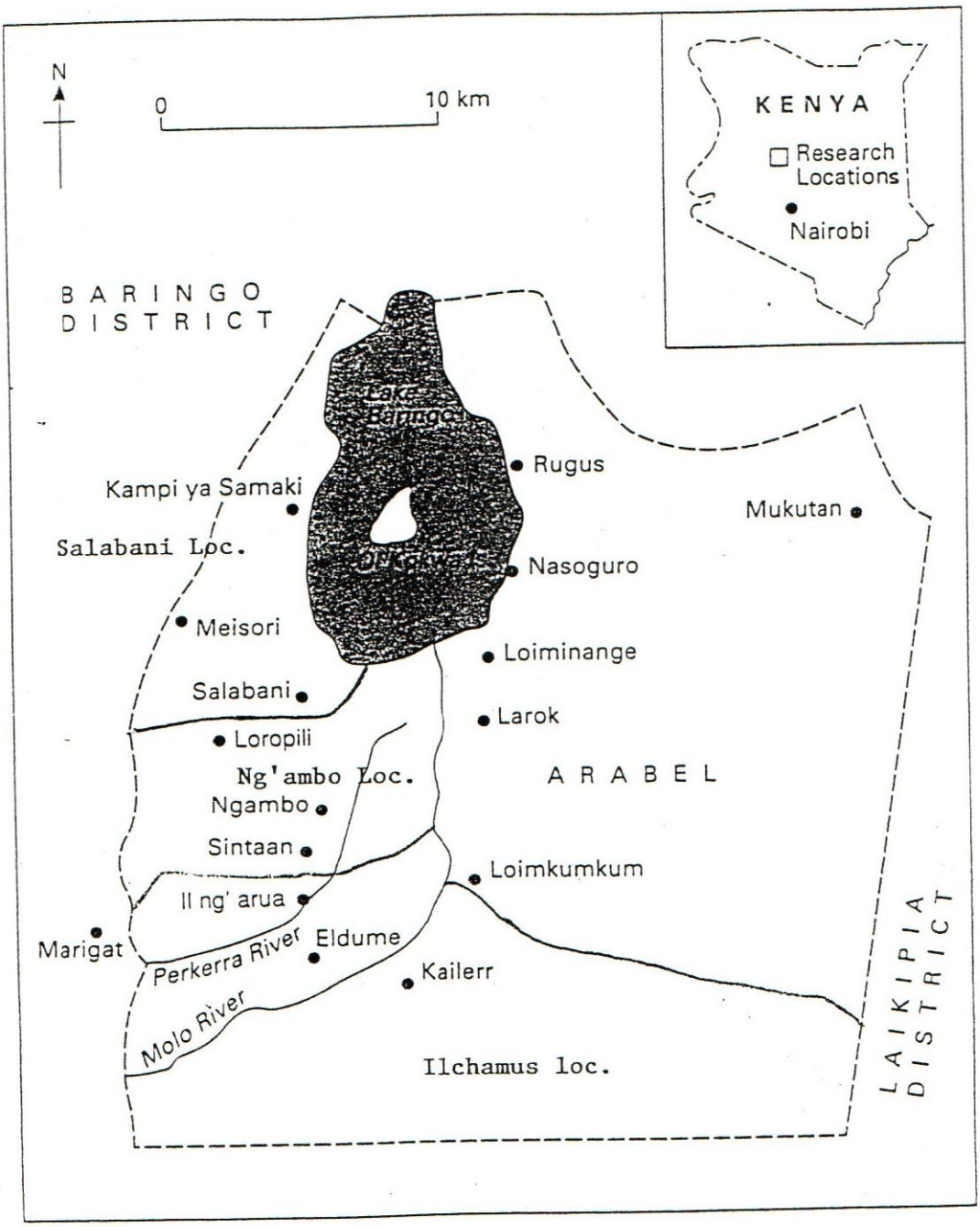
The research site covered - Marigat division of Baringo district. It covers the lower parts of the district and is generally lowland. Data were collected from three locations namely; Ng'ambo, Il-chamus and Salabani (see page 25). Household surveys and interviews were carried out within these locations.

MAP OF THE STUDY AREA (BARINGO DISTRICT)



Map of Baringo District
(Source: Baringo District Development Plan (BDDP), 1999)

MAP OF THE STUDY SITE



Research Sites, Salabani, Ng'ambo and Ilchamus Locations (Source: Little, 1992)

3.3 Study Population

The population of Baringo district was 347,990 people according to the 1998 statistical abstract, this population was projected to be 379,100 and 422,404 in the years 1999 and 2001, respectively. Marigat division was projected to be 54,202 and 60,392 by the years 1999 and 2001 respectively, while the study population, the Il-chamus were 15,897 about 0.07 % of national population (Republic of Kenya, 1998). Growing ASALs (Arid and Semi-Arid Lands) population without corresponding growth in private or public investment have led to falling per capita incomes, rising rates of poverty and malnutrition, and high rates of environmental degradation (Republic of Kenya, 1997).

3.4 Theoretical Framework

Provision of formal education to the pastoralist society has a positive impact on their ability to meet and cope with many risks and disasters that befall them such as drought menace, livestock diseases, loss of grazing pastures due to ethnic conflicts and cattle rustling.

Variations in these two variables depend on the level of investment on livestock, variation in assets diversification, areas of investment and income remittances to the relatives. The level of preparedness to face the risks/disasters by the herder when formal education is acquired will therefore be determined by how much he invests in livestock, other assets owned/sources of income and location of these investments.

Formal education has therefore a positive influence in investment on livestock, assets diversification, and distribution of remittances and areas of investment, while having

negative impact on the degree and severity of impacts of risks/disasters on the herder's household. The level of investment on livestock, degree of assets diversification and area of investment will reduce the severity of external shocks on the herder.

3.4.1 Education in Investment on Livestock

The relationship is such that the herders with formal education will tend to invest more of their income on livestock. They will buy them more frequently at the same time improve on breeds by buying superior types and diversify their herds. They spend a substantial amount on management.

3.4.2 Education on Assets Diversification

Herders with formal education tend to look for other options where they can earn extra income. In this case they will try to invest on shops, kiosks, hotels, rental houses, transportation and so on, as methods of assets' diversification.

3.4.3 Education on Home Investment

It is assumed that herders who are working elsewhere (away from home) will always think of investing at home. They will tend to invest more around their home areas to take advantage of cheap home labor, security and ease in management.

3.4.4 Education on Remittances

It is a fact that most of the herders who have formal education did not pay school fees themselves. This was done either by their parents, close relatives or sometimes the community. They will be obliged to send money home to assist their relatives. It is also

away of appreciation for the education provided. It is also assumed that when distant relatives financed the education they will too receive their share of the income remitted. The remittance will help recipients lessen the impact of risks on them.

3.4.5 Education on Risk Management

Education through the above intervening variables will mitigate the risks faced by pastoralists. Education opens opportunities for people to choose among many options which they can best invest on.

3.5 The Conceptual Framework

As illustrated by the *Figure 1*, risks and uncertainties in any pastoral community can be understood as both natural and artificial occurrences that affect the pastoral people mostly at the time when they least expect. These include droughts, floods, animal diseases, famines and cattle rustling are some among the many problems encountered by these communities in their daily lives. It is therefore assumed here that provision of formal education to these communities can be one positive move that can lead to better management of the risks encountered. Education here in broad sense is taken to be like a catalyst that will open up their minds and thoughts on how better they can live with livestock. In this sense, it is assumed that they will be able to invest better in qualities, quantities and be able to generally manage their livestock in a more profitable way. Education is assumed to equip them with knowledge on diversification of their capital assets, investment on other properties not necessarily livestock and for those in labour market, would support their relatives through various forms of remittances sent home on daily or monthly basis. It is therefore assumed that formal education directly or indirectly

influences herders knowledge on the above interventions which in turn lead to better management of the risks and uncertainty situations.

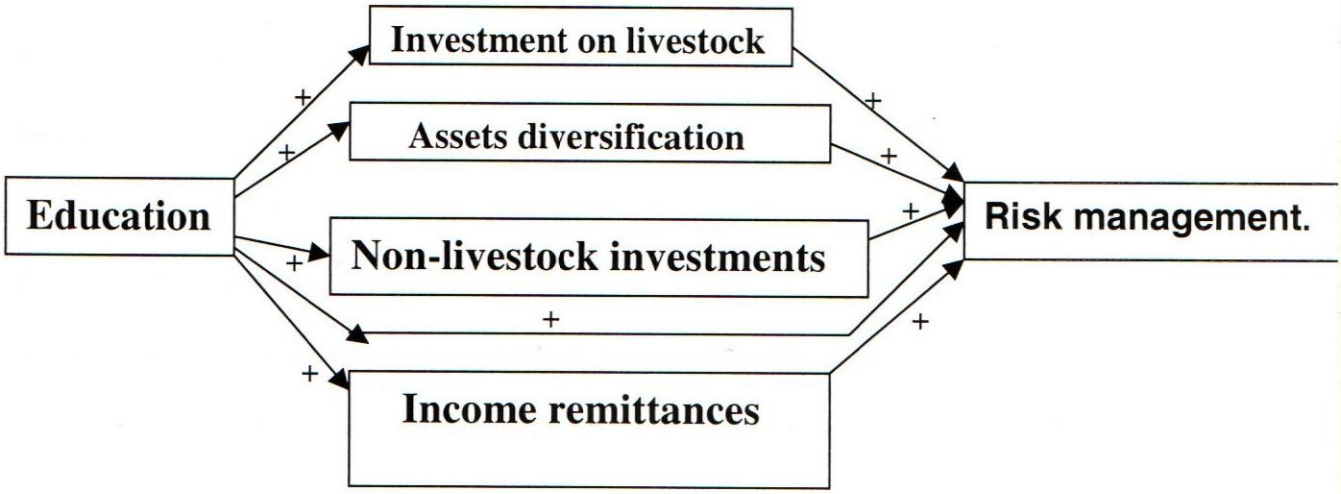


Figure 1: Conceptual Model

3.6 Definition of Terms and Operationalization of Study Variables

The following study variables, as depicted in the above *figure 1*, were defined and measured as follow:

Education: Education here refers to the extent of formal education a person has attained. Education is obtained through a learning process as provided in the school syllabus. This variable was determined by finding out whether the respondent had formal education, and the level of education attained. It was categorized as follows: category 1, no formal education, category 2, primary education, category 3, secondary education, and category 4, post- secondary level of education.

Investment on Livestock: This refers to the number (heads) and types (breeds) of livestock owned, and management costs (including frequency of purchasing animals,

expenditures on labor, veterinary services, farm structures among other types of expenditure). This variable was measured by determining how much on average, is spent in a year to buy livestock, to pay annually, on average, for management (drugs, hiring of labor, farm structures), and to pay for the breeds of livestock purchase and management (different breeds are valued differently i.e. local breeds are less valued than exotic breeds).

An index for the variable, investment on livestock, was created from the following indicator characteristics.

1. The type of breeds owned by the household was determined. Depending on type, they were scored as follows: local breeds scored 1 point, crosses 5 points, and exotic breeds, 9 points.
2. The number of livestock owned by each household. The total number of livestock owned by a household was counted and used in the investment in livestock index. Three classes of livestock ownership were created as follows:

Category 1: 0-20 cattle, 0-30 sheep/goats-they score 1point

Category 2: 21-60 cattle, 31-80 sheep/goats-they score 5 points

Category 3: more than 60 and 80 cattle and sheep/goats respectively score 9 points

3. Investments on management were determined by creating an index on all expenses: drugs, hired labor and other related costs to management. These expenses were all summed up to get total annual expenditure on management of livestock. These costs were first added up and then divided into four categories. Category 1 were those who had no costs on management, that is Kshs 0.00 per year, category 2 had some minor costs between Kshs 1.00- 3,600.00 per year, category 3 had costs of between Kshs

3,601.00- 12,000.00, while category 4 had incurred considerable costs of over Kshs 12,000.00 per year. Index scores for each category were: category 1, score 1 point, category 2, 5 points, category 3, 9 points while category 4, 13 points.

The investment on livestock index with a sum of the indices of the above three indicator characteristics is represented by the formula:

Investment on livestock = [index score on breeds] + [index score on livestock number] + [index score on management costs]

Assets diversification: this refers to the extent a herder diversifies capital assets, other than livestock, such as a house, rental houses, trading premises, farms, vehicles, bicycles among others. The above indicator assets are used to measure the variable (assets diversification) by summing up the different types of assets to constitute an index. Assets diversification index = [the total number of different type of assets owned by a household].

The variable index was categorized into: category 1, low diversity, 1-4 assets in total scored 1 point, category 2, 5-8 assets in total scored 5 points, while category 3, have over 8 assets in total scored 9 points.

Non-livestock investments: this refers to total amount of money invested by herders in non-livestock assets. These include total investments in rental houses, farms, trading premises, residential houses, vehicles, and bicycles among other assets.

Non-livestock investment is measured by the above indicator assets by summing up their total values in Kenya Shillings. Thus the formula will be;

Non-livestock investments index = [total cost invested in residential house + store + rental house + trading premises + bicycle + tables/chairs + motor vehicle + farm + beds + television/ radio].

This index was put into three categories: low investment, spent between Kenya shillings 0.00- 338,000, scored 1 point, medium investment, spent between Kenya shillings 338,001- 678,000, scored 5 points, while the third have high investments over Kenya shillings 678,000, scored 9 points.

Income remittances: this refers to the amount of cash if any received by the household from an emigrant who is either in wage employment or doing a business and living away from the original home. This variable was measured by totaling the amount of money received in Kenya shillings by the original household in a period year from the emigrant. This variable was categorized according to the level of amount of cash received per year. Category 1 is poor remittance, category 2 is medium remittance, category 3 is medium-high while category 4 is high remittance.

Risk management: risks are those recurring hardship situations that herders face in their daily lives as nomadic pastoralists.

To manage risk is to put in place/ implement those activities that will help to avoid or reduce the impacts of those hardships to the people, their livestock and the environment and put in place mitigation procedures where the hardships have occurred.

In determination of these, 4 key hardship situations were used, drought, raiding/ theft of livestock, famine and diseases prevalence. An appropriate index was created for each of these hardships and a score was awarded on the basis of its usefulness as follows:

Risk management index: This is calculated as follows: [drought management options + famine management. options + raiding management. options]. Scores: 1 is poor strategy. 4 is better strategy. 7 is good strategy and 10 is best strategy.

In disease, management options index was determined separately. The scores were as follows: 1 is bad strategy, 5 is good while 9 is better strategy. The scores we used for ease of analysis. they are nominal and have the same range.

The above 5 variables are the ones in our conceptual model for which relationships were determined. There was also need to measure the variable socio-economic status which was not in the conceptual model but in the objectives and hypotheses. Socio-economic variables were measured by household income and expenditures only.

Indices on risk management coping strategies

Four risk situations were considered in this study due to their frequency and side effects to the people. These were raiding, drought, famine and livestock diseases. The first three had each four coping strategies. They were scored on their basis of ability to mitigate the side effects. The scores were 1, 4, 7 and 10. Livestock diseases had three coping strategies and were scored 1, 5 and 9.

3.7 Research Design and Sources of Data

This study used sociological inquiry design form of survey in data collection exercise and both primary data and secondary data were collected in the process. In order to meet the requirements of a comparative study, the educated and the non-educated herders were interviewed and information from them constituted the primary data. A questionnaire was

used in this survey to collect information from the household on the following variables - education, investments on livestock, assets diversification, location of investments, home remittances and risks/external shocks.

Secondary data were obtained from the divisional and locations administrative offices of the division. These included total population in the division and locations, total number of educated herders those who had obtained formal education within the study locations and the size of the area to be covered.

3.8 Sampling Procedure

The survey was conducted in Marigat Division of Baringo district. The preliminary survey begun by purposeful picking Marigat division in Baringo district that was noted to be predominantly inhabited by the Il-chamus community who are pastoralists. All the locations in the division were purposely picked from which respondents for this study were simple randomly selected. To select the households to be interviewed from each location, a list of households from all location was drawn using the data available from the local chiefs' office as the frame. From this list, a simple random selection was used to draw the study sample. Unit of analysis was individual herders' households and their assets/ properties. Individual herders who were expected to be the head of the household provided nearly all the information on variables of interest in this study.

3.9 Sample Frame and Sample Size

All herders with formal and those without formal education within the Il-chamus community of Marigat division, Baringo District formed the sample frame. A

representative sample of 95 herders was picked through random sampling from each group of the two education categories of herders. A sample of 190 people was picked; in addition to the 20 random sample that was already surveyed in1980-1981 by Prof. Little thus in total 210 herders constituted the sample size for this study.

3.10 Data Collection

A questionnaire with structured questions and fill-in tables was administered (*see* appendix 1). This tool was used to collect primary data (this was the raw data collected from households) for the study. Secondary data (documented information) was extracted from the divisional and locations administrative annual reports among other sources.

3.11 Data Analysis

After the questionnaires were administered, they were checked of any wrong entries. The questionnaires were numbered and entered into the computer for analysis. The data was analyzed using the computer based statistical package for social sciences (SPSS). Information collected was coded and scored in conformity with the hypotheses.

The following types of analysis were used:

a) Descriptive analysis was used analyze all the objectives to determine the measure of central tendency- mean, percentage and measures of dispersion of the various variables of interest in this study.

b) Chi-square (χ^2) statistics was used to analyze hypotheses one, two, three, four and five.

c) t-test statistics was used to compare the sample means of herders with formal and non-formal education in terms of diversity of assets and livestock investment. This statistic was used in testing hypotheses one and two.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

Discussions and summary tables bellow were the findings of the research that was carried out in Baringo district between January and April 2000. The various findings were discussed in the following two sections of this chapter.

Part I: DESCRIPTIVE ANALYSES

4.1 Socio-economic characteristics of the Il-chamus community

4.1.1 Age

The mean age of the respondents was found to be 41.4 years. The minimum age was found to be 19 years while the maximum age was found to be 92 years. Within this range of 19 to 92 years, that of females were 19 to 72 years, those for the males were 22 to 92 years.

4.1.2 Ethnicity

As one would expect, the entire household heads in the three location are Il-chamus. This land is exclusive to this community for many years as far as they can recall.

4.1.3 Sex of the respondents

There were 137 males interviewed representing 65.2% of the respondents, while females were 73, representing 34.8% of the total respondents.

4.1.4 Pattern of Household Headship

All the male respondents indicated that they were the full-time heads of their households. There were two distinct groups, as far as female household heads respondents were concerned:

a) "Full-time" household heads: these were the women who were heads of their households, on a full-time basis. There were 3 main categories in this group. There were those whose husbands were dead, those who were unmarried, and those whose husbands were present but did not head their households.

b) "Part-time" household heads: these were the women who were heading their households on a temporary basis, in the absence of their husbands.

The numbers of respondents in the gender categories of household heads are shown in Table 1.

Table1: Distribution of household heads by Gender

Gender of household head	Number of respondents	% respondents
Male headed	146	69.5
Female headed	57	27.1
Total	**203**	**96.6**

Source: Household Survey, 2000

The findings from the study indicate that a large number of female respondents about 57 (78% of females interviewed) are heading their households. This situation is explained by the fact that very many male members of the community are engaged in employment outside their home area with some few living as widows or single parents. The phenomenon of women being household heads is common in many developing countries As a result women are playing a very major role in development, especially in the rural areas of which Il-chamus community is one.

4.1.5 Primary Occupation

The respondents were asked to indicate their primarily occupation which are also source of subsistence. The responses were grouped into four main category sources of income: salary/ wage employment, pure herders/ housewives, farmers/ herders, self-employment (kiosk owners, vegetable sellers, animal traders, skin trades, shop owners, millers, tailors, secondhand cloth sellers etc). Table 2 gives a summary of the number of respondents engaged in various forms of income generating activities.

Table 2: Respondents occupations.

Type of occupation	No. of respondents	Percent
Salary/ waged employment	63	30.0
Herders/ housewives	60	28.6
Farmers/ herders	60	28.6
Self-employment	22	10.5
Total	**205**	**98.7**

Source: Household Survey, 2000

From the above table, majorities of the respondents were engaged in three main occupations- waged employment, herding or housewives and a combination of farming and herding.

4.1.6 Location/ town of work

The respondents who were engaged in salaried or waged employment were asked to indicate towns where they were working. This was considered important because those who are locally employed are expected to supply their families with their daily food and other household necessities while those in external employment are assumed to be sending some remittance to their families frequently. The remittance in whatever form is thought to ease family stress in times of hardships like in drought or famine periods. Out of 210 respondents who were interviewed only 65 or 31% were employed and were either

earning salary or wages. Table 3 summarizes the distribution of respondents engaged in different occupations. They are either classified as local employment (within the district) or external employment (out of the home district).

Table 3: Distribution according to location in wage employment.

Location of employment	No. of respondents	Percent
Local employment	54	25.7
External employment	11	5.2
Unemployed	145	69.0
Total	**210**	**100.0**

Source: Household survey, 2000

The large number of respondents who indicated that they were not employed show that a large percentage of them are either farmers/ herder, pure herders or self-employed. Other possible reasons for high unemployment are low education level in the community or government policy to freeze employment.

4.1.7 Education level of household heads

For the purpose of this study, the education levels were classified into four categories as follows:

i. Illiterate: this category consisted of those people who had never had any formal schooling. Those who had only attended adult literacy classes were also put under this category.

ii. Primary education: the levels considered here were primary school, from standard one to standard seven or eight.

iii. Secondary education: the levels considered here were form one to form six and have not gone to any other training.

iv. Post secondary: this category was meant to be for those who had gone beyond secondary school, into college or to formal training. However, very many different groups fell under this category. There were those who had finished secondary school at form six, and then gone to college, those who had finished in form four, and those who had finished in form two. Many of these were trained either as teachers or policemen.

Table 4 summarizes the above information.

Table 4: Numbers and Percentages of respondents with various Education level by gender

Level of Education	Female Resp.		Male Resp.		Total Resp.	
	No.	%	No.	%	No.	%
Illiterate	58	27.6	30	14.3	88	41.9
Primary	12	5.7	60	28.6	72	34.3
Secondary	2	1.0	19	9.0	21	10.0
Post-secondary	1	0.5	28	13.3	29	13.8
Total	**73**	**34.8**	**137**	**65.2**	**210**	**100.00**

Source: Household Survey, 2000

Table 4 indicates that a greater proportion of women is found at the lower levels of education than men and majority of women were illiterate. At the primary, secondary and post secondary level, there is a greater proportion of men. At these levels, the male respondents outnumbered the female respondents. The implication here is that more of the male respondents are educated as compared to the female respondents, and in addition, more of them have attained higher levels of education. This is consistent with the findings of a world bank study and UNICEF baseline survey report carried out in

Baringo, where women are found to dominate the lower levels of education (UNICEF, 1993; World Bank, 1992).

4.1.8 Family sizes

The respondents were asked to indicate how many persons resided in their households. The mean number of household members was then computed. The mean family size for the respondents was found to be 7.04. The family sizes were then categorized into four groups: small size households (1-7 persons), medium size households (8-14 persons), medium to large size households (15-22 persons), and large size households (more than 22 persons). The distribution of various household sizes is summarized in Table 5.

Table 5: Number and percentages of respondents in various Family sizes

Family size	No. of Respondents	Percent
1-7	131	62.4
8-14	73	34.8
15-22	2	1.0
More than 22	4	1.9
Total	**210**	**100.00**

Source: Household Survey, 2000

The majority of the respondents had families with persons between 1-14 members. The smallest family size was 2 people, while the largest was 27.

4.2 Herders Livelihood

4.2.1 Recovery period after a severe drought (1984/5 & 1999/ 00)

All herders interviewed were asked to discuss and compare the past droughts as much as they could recall. The 1999/00 drought was reported by all the herders as the worst ever witness drought only comparable to of 1930's which they refer to as *'nesawatie'* (this is the place people went to search food) in the local dialect. The drought according to these herders is considered very severe when goats among other livestock succumb to it. They were asked to indicate the approximate time in years they usually take to recover from shocks of drought to recover fully given that normal rains continue and no crop failure reported. Recovery period was computed as reported and the mean recovery period was found to be approximately 3.7 years while the mode was 3 years. The minimum recovery period reported was 0.0 year while the maximum period for recovery was reported to be 10 years.

4.2.2 Restocking processes

The herders were asked whether it is common for them to restock their herds after such a severe drought, of which all of them answered in affirmation. In an open discussion with a few selected herders on the issue of restocking, all the old and illiterate herders indicated that given capital (cash money) they would have to restock because this is their only source of livelihood. This is where they get food, money for school fee, medical expenses, money for clothes, payment of dowry (bride price) among other things. They also argue that no drought follows another, so they can comfortably buy more livestock for the good seasons that will follow.

Contrary to the above reasoning, educated and working herders, argue that though they will restock but to a limited extend since they do not want to experience the same lesson that was taught by the 1999/ 00 drought. Some families reported up to about 97% losses in their cattle due to drought, while many reported al least over 60% losses. They too argue that among the few that they buy the majority should be steers that can easily be sold when another drought is looming or when seasonal weather is not good enough. The respondents were also asked to indicate their common sources of capital/ cash they use to buy livestock to restock their herds. Table 6 summarizes this. Sources of money were grouped into four main categories: salary/ wages, trading/ business, sell of other livestock and combined salary/wage/ trading or business.

Table 6: Herders' Sources of cash for restocking

Source of cash	No. of respondents	Percent
Salary/ wages/ loans	58	27.6
Trading/ business	5	2.4
Sell of other livestock	29	13.8
Combined salary/ trading/wages	4	1.9
Total	**96**	**45.7**

Source: Household Survey, 2000

From the table above, out of 210 respondents about 96 or 45.7% said they restocked after the drought. The respondents were also asked to indicate possible reasons why they had to undertake restocking. The answers were summarized into four major reasons of restocking. These are summarized in Table 7.

Table 7: Reasons for restocking after serious losses

Reasons for restocking	No. of respondents	Percentage respondents
Increase family wealth	69	32.9
Investment to boost income	26	12.4
Prestige/position in society	3	1.4
Risk management strategy	1	0.5
Total	**99**	**47.2**

Source: Household Survey, 2000

It is evident from this table the major reason for restocking is to boost the family wealth, followed by boosting family income. Risk management is the least reason given.

4.2.3 Education and Occupation of persons in employment

The respondents who indicated to be working either as self or regular employment were asked about the education level. The figures were computed and summarized in bellow.

Table 8: Number and Education level of persons in labor market

Education level	Number	Percentage
Illiterate	10	4.8
Primary education	20	9.5
Secondary education	31	14.8
Post-secondary education	9	4.3
Total	**70**	**33.4**

Source: Household Survey, 2000

From this table, majority of those employed have attained secondary level of education. Those in various occupations were summarized into three categories of occupation namely: permanent employment, contract and/ or wage employment and self-employment. Their numbers were computed and summarized in Table 9.

Table 9: Number and occupation of various respondents in labor market

Occupation of respondent	Number of respondents	Percentage
Permanent employment	46	21.9
Contract/ wage employment	8	3.8
Self- employment	10	4.8
Total	**64**	**30.5**

Source: Household Survey, 2000

The bulk of those respondents employed are in permanent employment, while those on contracts and self-employed are very view.

4.2.3 Salary

Those persons who were in employment, either self or regular were asked about their salaries per month. Salaries ranged from Kshs 500.00 to Kshs 43,000.00 per month. Salary incomes were categorized into five groups: no salary group (Kshs 0.00), low income group (Kshs 500.00 to 3500.00), middle income (Kshs 3501.00 to 7000.00), middle-high income group (Kshs 7001.00 to 15000.00) and high-income group (Kshs >15000.00). These groups are summarized in Table 10.

Table 10: Herders levels of wages income

level of Income	No. of Respondents	Percentage	Valid percentage
No income	140	66.7	70.0
Low income	11	5.2	5.5
Middle income	23	11.0	11.5
Middle-high income	16	7.6	8.0
High income	10	4.8	5.0
Total	**200**	**95.2**	**100.00**

Source: Household Survey, 2000

Majority of the respondents had no income about 66.7% of the population, followed by those with medium level income. The low level of employment in the community can explain this.

4.2.5 Remittance

For the sake of this, these refer to cash, clothes, food and any other material that is sent home by persons working in other towns to their relatives/ families in the rural homes. Remittances play an important role in that, in whichever form, they assist those who receive ease a stress that they may be in. Cash mostly remitted homes is used for such purposes as to buy food, purchase drugs, cloths, pay for hired labor, construction of houses/ huts and any other need that arises. In this study it was found that about 55- households received remittances on regular basis.

In the labor market, it was found that there were about 41 (19.5%) of total respondent households that have at least a member in employment. Of these about 30 (14.3%) households have one member each, about 7 (3.3%) households with two members each, about 3 (1.4%) households with three members each and about 1 (0.5%) household with five members in labor market.

From this study, about 35 (16.7%) of total respondent households said to have assisted one or more non-household persons acquire formal education. Those households that had a member working out were asked on how much they receive each month on average in terms of cash and other goods. Monthly remittances were computed on annual basis. The range was found to be between Kshs 200.00 to Kshs 60000.00 per year. The recipients were grouped into four categories. Poor recipients got Kshs 1.00- 5999.00. Medium recipients got Kshs 6000.00- 12000.00. Medium-to-high recipients got Kshs 12001.00-

36000.00, and High recipients got Kshs 36001.00-60000.00. The numbers in each recipient group were summarized in Table 11.

Table 11: Remittance distribution levels in Kenya shillings

Remittance range in Kshs	No. of recipients	Percentage
1- 5999	35	16.7
6000-12000	11	5.2
12001-36000	7	3.3
36001-60000	2	1.0
Total	**55**	**26.2**

Source: Household Survey, 2000

Form the table above, it is clear that majority of those who receive remittances got very little, followed by medium recipient and least are the high recipients, of which only 1% among the respondents are in this category. From the survey done and data available, the above distribution can be explained by the fact that very few members of the community work outside the home district. Most of them are working locally, hence their income is consumed directly by the family. Their income is therefore considered to be household daily income not remittance.

4.2.6 Use of remittances

As stated earlier, remittances strictly in this study will refer to cash remitted home by those family members working in the urban centers. The respondents were therefore asked what major uses they put into the remittances (cash) they receive. Uses were categorized into four:

i) Household needs- food, cloths, hospital bills etc

ii) School related expenses- school fee, uniforms, shoes etc

iii) Investments- farming, buying of livestock, shop/ kiosk business etc

iv) Payment of wages- hired labor to the farm, keep livestock, watchmen, househelps e.t.c.

The various uses of remittances were computed and results are summarized in the Table 12.

Table 12: Uses of Remittances

Uses	No. of respondents	% respondents
Household needs	50	23.8
School related needs	5	2.4
Investments	0	0
Payment of wages to hired labor	0	0
Total	**55**	**26.2**

Source: Household Survey, 2000

Results of the table above indicate that remittances are used in two major functions: household needs and school related issues. This further explains why few people among the respondents run businesses or use their income to hire labor. From available data, there are only about 30 people who run some form of business and have no remittances, while about 32 said to hire some form of labor in their homes.

4.2.7 Remittance regularity

This was computed by dividing regularity into every month, more than 6/12 and less than 6/12. From the total population of 56 recipients, the following was their remittance regularity.

Table 13: Regularity of remittance received

Regularity	No. of respondents	Percent
Every month	25	44.6
More than 6/12	14	25.0
Less than 6/12	17	30.4
Total	**56**	**100.00**

Source: Household Survey, 2000

From the above table, it shows that majority of those who send remittances do it more regularly. Those who send less than half months of the year are only about a 1/4 (25%).

4.2 8 Decision making on the use of remittances

This was quite an important question in this study. Since remittance is thought to ease family stress in hard times. The right use of remittance is a very crucial one. In some instances, a sender might remit cash and let the recipients use their discretion to see how best they can put it into, while others would want to give direction on how their money should be used. Out of the 56 recipients 44 of them said the male household head makes this decision, 12 said that the mother/ wife recipient makes the decision, while only 1 respondent said that their children (son/daughter) makes decision on the use of remittances.

4.3 Households sources of income

4.3.1 Salary/ Wages

Respondents working were asked to give their approximate amount of salary/ wages they earned in the past one year. It was found out that about 92 (43.8%) respondents earn some form of income, (salary/wages). These were computed and grouped into four

categories: low income, middle income, middle-high and high income groups. The distributions are summarized in Table 14.

Table 14: Distribution of salary incomes by groups

Income group	Earning range in Kshs	No. of Respondents	Percent
Low income	1200.00- 36000.00	43	20.5
Middle income	36001.00- 84000.00	29	13.8
Middle-high income	84001.00- 180000.00	17	8.1
High income	>180000.00	3	1.4
Total	**-**	**92**	**43.8**

Source: Household Survey, 2000

From the above table, results indicate that majority of the households earning salary/ wage are in the low income group, and a very small group, 1.4% are found in the high income bracket. Uses upon which these incomes were put into were analyzed and were found out that, incomes had three major uses: household needs, household needs & investment and investment only. About 79 (37.6%) respondents use their income in household needs, about 11 (5.2%) use for household & investments, while only about 7 (3.3%) put into investment.

4.3.2 Other major sources of Income to the households

There are as many sources of income as the number of household are but in this study a few common and major sources were used, and information on them were collected. The most common ones among many families include: sale of livestock (cattle, sheep and goats), sale of crop produce, small scale trading such as kiosks, shops, while the minor sources are sale of firewood/ charcoal, sale of honey sale of handcrafts/ curving and etc.

Each of the above item source of income is computed on its own to find out each contribution to the general income of the family.

A) Sale of cattle

Individual respondents were asked to say the number of cattle that were sold that year (within the last 12 months from the date of interview and prices). From this information, total annual income from large stock was computed. Out of the total 210 households interviewed, 116 (55.2%) of them had income from this source, while 94 (44.8%) did not have. One would naturally ask why many people seem not to depend on income from cattle, yet the Il-chamus are pastoralists? There were many reasons attributing to this, but there are two most possible reasons among others: First, this survey was carried out when the drought was severest and had died in great numbers. Secondly, the community seemed to diversify its sources of income, as indicated by subsequent evidence. Income from large stock were computed and summarized in the following groups as shown on the summary Table15.

b) Sale of sheep and goats

When carrying out this survey, both sheep and goats were put together as small stock. Their numbers sold and market price in the past one year were computed. Of the 210 respondents, 158 (75.2%) of them had income from sale of small stock and only 51 (24.3%) did not have this income. Income from sheep/goats is summarized in Table 15.

c) Income from other trades (shop/ kiosk) in the past year

Among the respondents that were interviewed, 73 (34.8%) of them said to have had some income from this kind of trade, while 137 (65.2%) had no income related to shop trading. This distribution shows that shop/ kiosk business is one major venture that a good number of people seem to have gone into. The mean income from this trade is Kshs 12,105.00 per year, whereas the lowest income from trade was Kshs 10.00, one individual had as high as Kshs 960,000.00 per year. This is relatively a significant income to the traders. Actual distribution of income from trades is summarized in the Table 15.

d) Income from sale of crops

From the analysis of occupation of respondents, a number of them said that they are involved in both farming and herding of livestock, while others said that they were farmers. These were then asked about the much they get from sale of their farm produce. Majority of them actually say to consume most of their produce in the family since not much is harvested therefore very little was sold. Those that said to have had some income from sale of farm produce are about 80 (38.1%), while those that had no income from this source are 130 (61.9%). The mean income from this source was Kshs 5,932.00, while the maximum income got from sale of crops is Kshs 132,000.00. Table 15 summarizes this income.

Table 15: Distribution of major household income sources

Income	Group	Income Sources			
		Crops	Trading	Cattle	Shoats
0.00	No income	131 (62.4)	136 (64.8)	95 (45.2)	52 (24.8)
1- 12000	Low income	54 (25.7)	55 (26.2)	67 (32.1)	125 (59.5)
12001- 36000	Moderate	14 (6.7)	10 (4.8)	30 (14.3)	23 (11.0)
> 36000	High	11 (5.2)	8 (3.8)	17 (8.1)	10 (4.8)

Source: Household Survey, 2000. Figures in parentheses () are percentages.

From the above table, it is evident that sheep/goats were the most common sources of income among the people. Very few of them comparably had no income from this source. Cattle follow shoats as the second most common source of income. The above trend would be expected from a community that is basically pastoral in subsistence. Crops and trading are picking up too, although still good number of people did not have income from this source.

e) Minor sources of income to the household

These are income sources that few people seem to utilize in the community. They were included in this study because they depict whether there is a trend towards diversification in the sources of income.

1. Income from charcoal/ firewood

The respondents were asked if they had any income from the sale of firewood or charcoal. Only about 17 (8.1%) of them said to get income from this end, while 192 (91.4%) had nothing to do with sale of firewood or charcoal. Majority of those who had

this income got between Kshs 200.00-5000.00 per annum, while one person earned a total of Kshs 12000.00 and another got Kshs 15000.00 per year from this source of income.

One can easily conclude that, this source of income is a poor or unfavoured source of income among this community. Many respondents asked why they do not sale firewood or burn charcoal, claim that they are not used to it, therefore it is difficult to start doing it. They considered it a foreign activity associated only with certain tribes.

2. Income from honey

It was found out that this was not a common venture among the Il-chamus since only 4 (1.9%) of them were involved in this business. Income accrued from honey were not even significance as one of them earned only Kshs 400.00, while the highest got Kshs 6000.00 for the whole year. The contribution of honey to these herders can be said to be negligible.

3. Income from sale of handicraft and woodcarvings

From the sale of these items, there were no many people involved in this just like the sale of honey. Only 4 (1.9%) people were recorded to do this business. Although no much contribution to the society, but there seem to be one person who earned a lot of money from this. Of the four people, three of them earned between Kshs 2000.00 to Kshs 5000.00, while only one family did a lot in this since their income for that year stood at Kshs 40000.00. When interviewed, the lady who sells these handicrafts also happens to be a primary school teacher. She reported to be carrying her products to every market

place about four times a month. This is one example where an educated person diversified her sources of income.

4.4 Total Household Income from the various sources

Various incomes were added up to make for this total household income for the year. This was done so as to categorize people into various income groups. It gives a closer look into economic level of people, whether majorities are poor, rich or if there is a uniform distribution of wealth among the people. From this analysis, it was found out that The mean income for the community is Kshs 64,021.56, with a standard deviation of 10,2274,9. The maximum income was found to be Kshs 1,015,000.00, whereas 3 people claim to have zero (0.00) income in the past year, the actual minimum income recorded was Kshs 500.00. This is such a big difference between those with low and high income. The table below summarizes total income distribution among the Il-chamus.

Table 16: Total household income distribution from varied sources

Income category	Income level in Kshs	No. of respondents	% respondents	Valid %
Low	0-36000	113	53.8	54.1
Moderate	36001-84000	47	22.4	22.5
Moderate-high	84001-180000	34	16.2	16.3
High	180001-1100000	15	7.1	7.2
Total	-	209	99.5	100
Missing system	-	1	.5	-
Total	**-**	**210**	**100**	**-**

Source: Household Survey, 2000

More that half the population can be said to fall in low-income group, while a small proportion about 7.1% were found in the high-income group.

4.5 Household annual expenditures

These were expenses on health, cloths, food, education, livestock management, labor, assets, purchase of livestock and investment on business. Depending on household needs, each household had its own unique requirements, therefore, their income were used in certain needs more than the other household. Even where two households had the same needs, the amount of income apportioned into specific expenses were not the same. For example, where two households incur expenses on education and running of a business, one household may be had five children in school, and a kiosk, while the other household only one child in school, but they run a wholesale shop. These will definitely bring differences in income allocation to the household obligations. Household one will spent most of their income in education, while household two will spent most of their income on investment in wholesale shop. Therefore, the level of expenses on various obligations were categorized/ grouped for ease of comparison of house to house and to present a picture on what expenses/ needs the community was found to engage more on.

The expenses were divided into four categories/ groups:

i) No expenses-this is where a household had no expenses on this commodity, given Kshs 0.00 level of expense

ii) Not significant- a household allocated some of its income to this obligation/ need, but it was not in significant amounts. This was allocated Kshs 1.00- 3600 per annum (upto Kshs 300 per month).

iii) Significant-this was where a good portion of income was directed towards this need. Level of expense is Kshs 3601- 12000 per annum (upto Kshs 1000 per month).

iv) Major- this is where more than 50% of the household income is spent on the need. Level of expense is more than Kshs 12000 per annum (> Kshs 1000 per month).

The figures given above (level of expenses) were arbitrarily chosen, given that in Il-chamus community, more than 50% of the households fall in the low-income category, that is, poor category. Table 17 summarizes expenses on various obligations among the households.

Table 17: Annual household expenses on various obligations

Obligation	Respondent count/ %	No expense	Not significant	Significant	Major	Tot
Business	Freq.	180	7	8	15	21
	%	85.7	3.3	3.8	7.1	100
Health	Freq.	21	137	46	5	20
	%	10.0	65.2	21.9	2.4	99.
Cloths	Freq.	33	128	42	7	21
	%	15.7	61.0	20.0	3.3	100
Food	Freq.	2	42	64	102	21
	%	1.0	20.0	30.4	48.6	100
Education	Freq.	38	112	38	22	21
	%	18.1	53.3	18.1	10.5	100
Labor	Freq.	178	6	22	4	21
	%	84.8	2.9	10.5	1.9	100
Livestock mgt.	Freq.	39	124	42	5	21
	%	18.6	59.0	20.0	2.4	100
Savings	Freq.	111	43	36	20	21
	%	52.9	20.5	17.1	9.5	100
Assets purchase	Freq.	189	6	10	5	21
	%	90.0	2.9	4.8	2.4	100
Livestock buying	Freq.	166	11	15	18	21
	%	79.0	5.2	7.1	8.6	100

Source: Household Survey, 2000

From the above summary table, three major obligations that many household spent most of their income on in order from the highest are, food, education and savings while the three least they spent their income on from least expensive need are purchase of asset/ property, business and hiring of labor.

4.6 Livestock Diversity, Dynamics, Quality and Management

4.6.1 Livestock species diversity

This study had shown that about 94.8% of the respondents own some type of species of livestock or the other. Livestock here is taken to include Cattle, Sheep, Goats, Poultry, Camels and Donkeys. About 5.2% said to own no livestock at all. Table below gives a summary of livestock ownership among the people.

Table 18: Livestock ownership in various classes

Livestock class	Response	Frequency	Percent
Cattle	Yes	163	77.6
	No	47	22.4
Shoats	Yes	210	100.0
	No	0	0.0
Camel/ Donkeys	Yes	6	2.9
	No	204	97.1
Poultry	Yes	139	66.2
	No	71	33.8

Source: Household Survey, 2000

The community keeps six species of livestock: Cattle, Sheep, Goats, Camels, Donkeys and Poultry. From the table above, shoats are kept by all, 100% ownership, while Cattle is owned by about 77.6% of the respondents, while Camels and Donkeys are owned only by about 2.9% of the respondents.

4.6.2 Livestock Dynamics

These were changes that occur within the herds in a year. These include current numbers, deaths, births, sold/ eaten, stolen, lent or borrowed. From the data available collected at the time of this survey, the population changes of the three main classes of livestock owned were as follows:

Table 19: Livestock Dynamics in a year before and after Drought

Class of livestock	Current no.	Total no. before drought	Deaths due to drought	% deaths
Cattle	1448	2888	1440	49.86
sheep/goats	6727	8274	1545	18.67

Source: Household Survey, 2000

Loses due to drought are significant, given that about 50% of cattle were lost, while that of shoats is 18.67%. Figures could even be higher than this, since the survey was completed before the drought was over.

4.6.3 Livestock quality

One hypothesis put forward was that educated herders/ people invest more on quality improvement through keeping and breeding of high-grade cattle and shoats. From the data collected, cattle and shoats were divided into 3-breeds- broadly as Local (indigenous), Exotic and Crosses (local x exotic). Results/ findings indicate that among the cattle owners, there are about 162 respondents who kept local breeds and only about 2 kept crosses and none kept an exotic breed. For the shoats, all the owners kept local breeds and no one has exotic nor crosses in their *Bomas*. Therefore, the hypothesis that

education leads to keeping of higher quality livestock is not valid. On cross tabulating education & breeds of cattle, the results were obtained (see Table 20).

Table 20: Relationship between formal education and breeds of cattle kept

Education level	Breeds of cattle	
	Local	Crosses
Illiterate	63	-
Primary	55	2
Secondary	17	-
Post- secondary	27	-
Total	**162**	**2**

Source: Household survey, 2000

The table above indicates no relationship between formal education and breeds owned.

4.6.4 Livestock management

Livestock management here refers to aspects such as treatment of sick animals, supplement feeding, herding and general good care of livestock. From survey findings, the respondents reported the following:

i) that no feed supplements were supplied to their livestock, very negligible if any existed, but none was recorded. They only depend on natural herbage/ pastures. This therefore means that the herders meet no cost of feeding the animals.

ii) most respondents complained that veterinary services were very expensive. They complained that animals needed almost daily treatment with drugs which most of them could not afford. The drugs are very expensive especially the Acaricides and antibiotics. The table below gives a summary of cost of care and treatment of animals on an annual basis.

Table 21: Levels of Yearly expenditure on livestock management

Expenditure level	Amount in Kshs	Frequency.	% respondents
No expense	0.00	39	18.6
Low expense	1.00- 3600.00	124	59.0
High expense	3601.00- 12000.00	42	20.0
Very high expense	>12000.00	5	2.4
Total	**-**	**210**	**100.0**

Source: Household Survey, 2000

Level of expenditure is categorized into 4 groups: no expenditure, low expenditure, high expenditure and very high expenditure. Mean expenditure for the sample is Kshs 2866.59. Standard deviation of Kshs 5697.6, minimum expense is Kshs 0.00, maximum is Kshs 50000.00. The majority of the herders fall in the low expense group in livestock management. This could be due to insufficiency of funds to meet all the expenses. Very few of them can afford to fully meet these expenses, and these are the 5%, who fall in very high expenditures bracket.

On herding of livestock, there is generally a division of labor among the family members, where children and parents play certain important role in herding. Whereas children are generally expected to herd, external factors such as attending school have interfered with this. During this survey, household heads were asked to state among family members, who herds small and large stock. Table 22 summarizes this information.

Table 22: Labor division in herding in the household

	Frequency		Percent	
Herder	**Small stock**	**Large stock**	**Small stock**	**Large stock**
Wife/ Husband	8	40	3.8	19.0.
No herding	75	16	35.7	7.6
Boys/ Girls	58	42	27.6	20.0
Hired labor	14	26	6.7	12.4
Not applicable	55	86	26.2	41.0
Total	**210**	**210**	**100.0**	**100.0**

Source: Household Survey, 2000

From the above table, herders pay more attention to large stock compared to the small stock. This was evident from the level of labor allocated to them compared to sheep/goats. More grown-ups, men and wives are involved in herding of cattle than in sheep/goats, the same for hired labor, more of it was given to herd cattle that those that herd sheep/goats. While those who let animals graze on their own, more households let their sheep/goats graze on their own (no herding) than do the cattle. Boys and Girls are entrusted more to take care of small stock than the cattle. In comparison about 35.7% of the households let the sheep/goats graze on their own while only about 7.6% do for cattle.

4.6.5 Season of selling livestock

To pastoralists, a source of cash for all households' needs is through selling of their livestock. It is commonly known that these people hardly sell their stock unless when there is a pressing need, even when advised by livestock officers and other agents that overstocking is not good for sustainable livestock production. In this study herders were

asked whether they ever sell their stock and if so what season of the year they commonly do so? Table 23 gives summary of these findings.

Table 23: Selling season of stock

	Frequency		Percentage	
Season of selling	**Small stock**	**Large stock**	**Small stock**	**Large stock**
Dry	153	118	72.9	56.2
Wet	12	25	5.7	11.9
Anytime	27	19	12.9	9.0
Not applicable	18	48	8.6	22.9
Total	**210**	**210**	**100.0**	**100.0**

Source: Household Survey, 2000

Many animals are sold during the dry season compared to other seasons. About seventy three percent (72.9%) of small stock and 56.2% of large stock are sold in dry season, whereas in wet season only 5.6% and 11.9% of small stock and large stock are sold respectively. Reason given for this scenario is that there is always scarcity of food resources both to livestock and people in the dry season. Livestock are sold mostly in order to buy human food and other supplies.

4.7 Analysis of household Assets

These are valued properties that a respondent owns. A number of key assets common among the respondents were selected for analysis. Assets diversity gives a direction on people's accumulation of wealth/ capital accumulation. The key assets in this case selected include residential houses, stores/ granaries, rental houses, trading premises, bicycles, motor-vehicles, farms, lamp/ lantern, farm tools, wooden/ timber beds, tables/

chairs, radios/ television, cupboards, wall units/ sideboards. The Tables 24/25 summarizes ownership and amount invested in these assets respectively.

Table 24: Key household assets

Asset type	Response	Frequency	Percent
Residential house	Yes	209	99.5
	No	1	.5
Store/ granary	Yes	55	26.2
	No	156	73.8
Rental houses	Yes	6	2.9
	No	204	97.1
Trading premises	Yes	18	8.6
	No	192	91.5
Bicycle	Yes	126	60.0
	No	84	40.0
Motor-vehicle	Yes	4	1.9
	No	206	98.1
Farm	Yes	164	78.1
	No	46	21.9
Lantern	Yes	93	44.3
	No	117	55.7
Farm tools	Yes	197	93.8
	No	13	6.2
Wooden beds	Yes	159	75.7
	No	51	24.3
Tables/ chairs	Yes	160	76.2
	No	50	23.8
Radio/ television	Yes	64	30.5
	No	146	69.5
Cupboard/wall unit	Yes	13	6.2
	No	197	93.8

Source: Household Survey, 2000

It was found out that common assets among the people include residential houses, bicycles, farms, lamps, farm tools, wooden beds, tables and chairs and a few radios. These are common household necessities and are not very expensive either to acquire. It is important to remember that majority of the households are in the low-income bracket. Houses, which they all have, are temporary, while farms are acquired freely since the land is communally owned. See table below on investment in assets. Assets least owned include motor vehicles, trading premises, rental houses and wall units or cupboards. These are expensive capital assets that most of them cannot afford to have.

Table 25: Investment in capital assets

Type of Asset	Cost index	Frequency	Percent
Residential house	1	195	92.9
	5	14	6.7
	9	1	.5
Store/ granary	1	153	72.9
	5	52	24.8
	9	5	2.4
Rental houses	1	204	97.1
	5	3	1.4
	9	3	1.4
Trading premises	1	192	91.4
	5	16	7.6
	9	2	1.0
Bicycle	1	84	40.0
	5	96	45.7
	9	30	14.3
Chairs/ tables	1	50	23.8
	5	158	75.2
	9	2	1.0
Motor vehicle	1	207	98.6
	5	1	.5
	9	2	1.0
Farm	1	141	67.1
	5	68	32.4
	9	1	.5
Beds	1	53	25.2
	5	153	72.9
	9	4	1.9
Radios	1	144	68.6
	5	57	27.1
	9	8	3.8

Source: Household Survey, 2000

From the above table on investment in assets, all assets were classified depending on amount valued at or amount used to buy. Then the values were scored on an ordinal way from least cost met or no cost met for that item to very high cost met on that item, and an index is assigned each. For example, in residential housing; index 1 refers to temporary house/grass-thatched and mud walls while index 5 refers to semi-permanent house/tinned-roofed and walls and index 9 refers to a permanent house.

While for the rest of the assets, the value indices were represented as follows:

1 means to respondent do not have this asset hence no cost incurred while 5means low to middle valued asset/ investment and 9 means high valued asset/ investment.

Each asset has its unique value different from the rest therefore not same value bracket was used. Each items' value was determined, for example, for rental houses, the value range is Kshs 70000.00, its mid point is Kshs 35000.00. It was therefore calculated such that any rental house that cost anything between Kshs 1.00-35000.00 scores 5, while above this through highest value scores 9, and any respondent that did not have a residential house scores 1. This formula was applied to all assets using their respective values.

4.8 Area/ Geographical location of investment

One hypothesis was that educated individuals tend to invest their capital assets away their home areas due to favorable physical conditions or any other reasons known to them best. From the assets owned by respondents, there are only about 32 individuals who said to own assets outside their home areas, but actually these assets were still within their location or home division. Even though so they were asked the reason for owning them away? The major reason given by most of them is either availability of water or conducive conditions to farming. On cross-tabulating Formal Education and Number of Assets away, the following results were obtained Table 26.

Table 26: Relationship between formal education and number of asset away

Level of Education	No. of assets away from home area				Total
	0.0	1.0	2.0	3.0	
Illiterate	74	9	1	1	85
Primary	58	9	-	1	68
Sec.	16	4	-	1	21
Post-sec.	23	6	-	-	29
Total	**171**	**28**	**1**	**3**	**203**

Source: Household survey, 2000

From the above table, there is a total of about 85 illiterate respondents, of which only about 11 (12.9%) of them have investments away. Among the educated respondents, 21 (17.8%) of them have investments away. Although 17.8% is a small percent to warrant accepting the hypothesis, there is still some evidence that educated herder invest more away that non-educated herders.

4.9 Analysis of Risks/ Uncertainties Faced by the Herders

These are natural calamities and occurrences that befall herders in their day-in-day-out business of livestock keeping. They are conditions that have adverse effects on development of the pastoralists. They retard their progress forward in terms of wealth/ capital accumulation. They include drought, famine, animal diseases, raiding/ rustling and livestock market prices.

The respondents were asked to indicate whether they have experienced any of these events, if yes, how severe they were and incase of any losses, how many animals were lost. Remedial options known to them were noted down. These were the components of risk management. Table that follows summarizes occurrence of these events.

Table 27: Distribution of Risks as faced by Herders

Risk		Respondents		Severity of the problem						
		Frequency	%	Very severe	%	Moderately severe	%	Not severe	%	Deaths no.
Drought	Yes	206	98.1	191	91.0	13	6.2	6	2.9	2949
	No	4	1.9	-	-	-	-	-	-	-
Famine	Yes	206	98.1	125	59.5	79	37.6	6	2.9	-
	No	4	1.9	-	-	-	-	-	-	-
Diseases	Yes	198	94.3	79	37.6	113	53.8	18	8.6	1183
	No	12	5.7	-	-	-	-	-	-	-
Prices	Yes	127	60.5	-	-	-	-	-	-	-
	No	83	39.5	-	-	-	-	-	-	-
Raiding	Yes	6	2.9	-	-	-	-	-	-	6
	No	204	97.1	-	-	-	-	-	-	-

Source: Household Survey, 2000

Results in Table 27 show that very many people felt that drought, famine, animal diseases and market were a problem to them. Drought and famine scored highest in terms of problems faced by the community, while raiding scored the least, since only about 6 (2.9%) respondents complained about its occurrence. More animals died due to drought than due to diseases. Cattle rustling/ raiding was not a major community problem, but rather petty theft amongst them.

4.10 Risk Management Options as employed by Pastoralists

Respondents were asked on what remedial actions they take when confronted by the above-discussed risks. They had very interesting and varied answers.

Management options due to drought. There were four responses/ answers given by the herders as a solution to this problem. The following were the answers and respondents to each: Migration to better areas - 114 (54.3%); Buy supplementary feeds - 41 (19.5%); Sell animals to reduce numbers - 38 (18.1%) and Invest into other businesses - 2 (1.0%).

Management options due to famine. Four responses/ answers were given by the herders as the solution to the problem. The following answers were given and respondents per each answer: Rely on relief supply - 32 (15.2%); Sell animals to buy food from shops - 148 (70.5%); Look for other sources of income like employment -19 (9.0%) and Rely on remittance from working family members - 7 (3.3%).

Management options due to animal diseases. There were only two responses/ answers given as a solution to this. These are: use of drugs to treat sick animals - 186 (88.6%) and selling of sick animals - 7 (3.3%).

Management options due to raiding/ rustling

Since many people did not experience this kind of a problem, they did not have an answer to it. The few who said to have had this problem gave their option as follows: migrate away from the source of problem - 2 (1.0%); retaliate - 2 (1.0%) and provide security - 1 (.5%). Since this is a problem caused by other people it wound have been very interesting to hear the kind of answers given if more people were affected by it.

4.11 Common Sources of Food during times of crisis like during Drought

Common sources of food during hardship times were analyzed and the following were the common ones, varying depending on each household economic status and its source of income. Findings are presented in the Table 28.

Table 28: Common Sources of Food among the Households

Food source option		Response	
		Frequency	%
Relief	Yes	119	56.7
	No	91	43.3
Remittances	Yes	30	14.3
	No	180	85.7
Selling animals	Yes	131	62.4
	No	79	37.6
Borrowing	Yes	76	36.2
	No	134	63.8
Salary/ wages	Yes	82	39.0
	No	128	61.0
Business/ trade	Yes	53	25.2
	No	157	74.8
Stored food	Yes	26	12.4
	No	184	87.6
Buying from shops	Yes	210	100.0

Source: Household Survey, 2000

From the above table, it is evident that people rely mostly on trading stores to get their food supplies, since only about 12.4 % of them depend on their stored foodstuffs (grains). Relief food supply plays quite a major role as a source of food to many, about 57% of the population seem to rely on free supplied food. The main source of money to buy food is through sell of livestock, followed by salary/ wages incomes. Role played by remittances cannot be ignored either, though not much. Borrowing is a key player in this society, where those who not have enough rely on relatives and neighbors to get their food and any other essential supplies.

4.12 Remedies taken after the risk period to ease their negative impacts

Respondents were asked what they commonly do after periods in order for their situations to go back to normal or near normal. Answers and response frequencies are given below.

Actions after the drought. These are fallback activities after the drought has hit very hard. These are: Farming activities - 118 (56.2%); Buy more livestock - 39 (18.6%); Improve management of remaining animals- 28 (13.3%) and Combination of farming, buying livestock and trading- 6 (2.9%).

Actions due to crop failure are: These are options tried when crops fail. They include; sell animals to buy food - 54 (25.7%); combine trade and farming -137 (65.2%); rely on salary/ wages/ remittances - 10 (4.8%) and borrowing of food - 5 (2.4%).

Actions due to famine. These are the alternative food sources when famine strikes hard. They include; selling of animals to buy food - 37 (17.6%); farming activities - 138 (65.7%); salary/ wage/ remittance - 15 (7.1%) and relief supply food/ borrow food - 15 (7.1%).

From the above actions taken to ease negative impacts of various risks/ uncertainties, many respondents seem to prefer a combination of more than one activity such as farming and trade. Farming as an option is common among many herders, and buying of more livestock. Salary/ wages and remittances are not common since not many people are working. From this analysis, there is a trend seen where people seen to diversify into other sources of income and food, not only depending on livestock as they used to.

4.13 Analysis of Socio-economic status of the respondents/ community

These are economic and social parameters used in this study to determine the economic level of the household in order to be able to say something about the economic strength of the people. A number of key questions were asked and keen observation was also taken along this to give a balance judgement on where the households should be placed. Qualitative and quantitative parameters were used. The qualitative indicators used here were food availability in the household, health status, shelter type, kind of clothing and water availability to the family. During the time of this survey, the researcher under-took an observation in order to compare what he sees and what the respondent gives. Table 29 summarizes these.

Table 29: Qualitative Socio-economic Indicators

Indicator	Response	Frequency	Percent
Food availability	Good	111	52.9
	Bad	99	47.2
Health status	Good	172	81.9
	Bad	36	18.1
Shelter type	Permanent	6	2.9
	Semi-permanent	72	34.3
	Temporary	132	62.9
Clothing	Good	162	77.1
	Bad	48	22.9
Water availability	Good	33	15.7
	Bad	177	84.3

Source: Household Survey, 2000

The quantitative data generated for this analysis, include mean annual household income and expenditure, mean annual expenditure on education, medicine, food, livestock management, hired labor, cloths and buying of livestock. Table 30 summarizes these.

Table 30: Quantitative Socio-economic Indicators

Indicators	Amount in Kshs
Mean annual household income	64,021.60
Mean annual household expenditure	54,539.30
Mean annual household expenditure on education	5,001.00
Mean annual household expenditure on modern medicine	3,262.30
Mean annual household expenditure on food	23,560.00
Mean annual household expenditure on livestock care	2,866.60
Mean annual household expenditure on hired labor	1,316.20
Mean annual household expenditure on cloths	3,604.00
Mean annual household expenditure on buying livestock	3,731.30

Source: Household Survey, 2000

The highest spending among the Il-chamus community is on food, followed by education and cloths, while the least spending is on hired labor. The general overview is that mean annual household income is more than the mean annual household expenditure.

Part II: ANALYTICAL RESULTS AND HYPOTHESES TESTING

Five hypotheses were tested here. Chi- square (χ^2) and Pearson's product moment correlation coefficient (r) was used to measure relationships and level of association between the variables under study and hence test the postulated hypotheses. A two- tailed significance test was used. The results are summarized in Table 32, while Table 31 shows the list of variables used.

Table 31: Variables Entered

Variable	Label
Educ.	Level of formal education index
Qlycat	Quality of livestock index
Totacat	Total classes of livestock index
Expcat	Level of expenses on management index
Riskcat	Risk management index
Asstcat	Total assets owned index

Table 32: Matrix for Pearson Correlation coefficients (r), 2-tailed sig.

	Educ	Asstcat	Qlycat	Totacat	Expcat	Riskcat
Educ (r)	**1.000** .					
Asstcat (r)	**.534**** **.000**	**1.000** **.**				
Qlycat (r)	**.014** **.861**	**.038** **.638**	**1.000** **.**			
Totacat (r)	**.087** **.216**	**.227**** **.001**	**.168*** **.139**	**1.000** **.**		
Expcat (r)	**.410**** **.000**	**.409**** **.000**	**.100** **.216**	**.306**** **.000**	**1.000** **.**	
Riskcat (r)	**.232**** **.001**	**.211**** **.001**	**.012** **.885**	**-.006** **.937**	**.102** **.165**	**1.000** **.**

* p < 05, ** p < .001,

The first value on each window is the chi-square value while r (relation coefficient)-value is measure of relationships between the various variables that were entered.

4.14 Association between Formal Education and Assets Diversity

Objective two was to determine and describe the association between education and diversification of capital assets by the educated herders away from livestock as a strategy to cope with risks associated with keeping of livestock only. While hypothesis two and three stated that there is no association between formal education with diversification and investment on other capital assets apart from livestock.

The results of the analyses for the relationships between formal education and assets diversity are summarized in Table 33.

Table 33: Association of Formal Education and Assets diversity

Level of diversity	Formal education				Total
	Illiterate	Primary	Secondary	Post- secondary	
Not diversified	51	14	-	1	**66**
Moderate	35	55	19	19	**128**
Very diversified	2	3	2	9	**16**
Total	**88**	**72**	**21**	**29**	**210**

(χ^2) = 74.6 at 6 df, Spearman correlation, (r) = 0.529 n = 210,

All were significant at $P < 0.001$

From the crosstabs and chi-square statistics computed, it showed that there is a strong association between education and diversification of capital assets. Therefore, we rejected the null hypothesis that stated that there is no association between formal education and diversification of capital assets. These are significant results for this study because one of its objectives was to find out the above associations. It is thought that assets diversification helps herders to cope better in hard times especially during time of drought or in case of disease outbreaks.

4.15 Relationship between Formal Education and Quality of Livestock

Objective one stated that education leads to investment in high quality livestock kept (based on value of the animal), while hypothesis one also stated that formal education does not influence investment in livestock quality (classes). The results are summarized in Table 34.

Table 34: Formal education by quality of livestock held

	Formal education				
Quality class	**Illiterate**	**Primary**	**secondary**	**Post-sec.**	**Total**
Local	58	54	17	26	**155**
Crosses	-	1	-	-	**1**
Exotic	-	-	-	-	**-**
Total	**58**	**55**	**17**	**26**	**156**

(χ^2) = 1.8 at 3 df, Spearman correlation (r) = 0.014, n= 156, All were not significant at P < 0.05.

From crosstabs and chi-square statistics computed above, it showed that there is no association between education and quality of animals kept. Therefore we fail to reject the null hypothesis that stated that there is no association between formal education and quality of livestock kept. This means that education does not necessarily make herders invest in better/ high quality animals. This could be due to the fact that the exotic livestock may not survive the hostile climatic conditions, as do the local breeds. Educated herders may therefore not want to risk keeping animals that may not tolerate such conditions.

4.16 Relationship between Formal Education and Total Livestock kept

Objective one was to find out and describe how formal education influence the number of animals an educated herder keeps, while hypothesis one also stated that formal education does not influence investment in number of livestock (educated herders keep many animals).

Chi- square cross tabulations was carried out to determine the association between the education level of respondents and total livestock kept (wealth level). The results are summarized in Table 35.

Table 35: Formal Education level by Total Livestock owned

	Formal education				
Total category	**Illiterate**	**Primary**	**Secondary**	**Post- sec.**	**Total**
0- 20	74	54	15	22	**165**
21- 60	6	7	5	2	**20**
> 60	6	7	1	3	**17**
Total	**86**	**68**	**21**	**27**	**202**

(χ^2) = 6.6 at 6 df, Spearman correlation (r) = 0.087, n = 202. All were not significant at P < 0.05

From the above analysis it shows that there is no association between education and quantity of animals kept. This means that education does not necessarily make herders increase their herds more than the ordinary herders. When asked why they did not buy many animals, they said that hostile climate and frequent droughts and outbreak of livestock diseases discouraged them from keeping many animals. They also said that they would prefer investing in capital goods/ assets than keeping of livestock. The capital assets were not much affected by changes in climatic conditions as do the animals.

4.17 Relationship between Formal Education and Expenses on Management

Hypothesis one stated that formal education does not influence the level of expenses in management terms of hired labor, buying of treatment drugs and general care. Table 36 gives a summary of the results of the chi-square cross tabulations for formal education levels and expenses level on livestock management.

Table36: Formal Education level of Expenditure on Livestock Management

	Formal Education				
Expense level	**Illiterate**	**Primary**	**Secondary**	**Post- sec.**	**Total**
Low	79	49	11	11	**150**
Moderate	9	22	9	15	**55**
High	-	1	1	3	**5**
Total	**88**	**72**	**21**	**29**	**210**

(χ^2) = 39.0 at 6 df, Spearman correlation (r) = 0.410, n = 210. All were significant at P < 0.001

From the crosstabs and chi-square statistics table above it showed that there is an association between education and management expenses on livestock. This means that herders with formal education, and who might likely be employed seem to hire more labor to take care of their livestock and also use a lot of cash to buy veterinary drugs for treatment of their livestock.

4.18 Relationship between Formal Education and Risk Management

Objective four was to find out and describe the influence of formal education on coping with risks/ uncertainty conditions such as droughts, famine and animal diseases; while hypothesis four also stated that there is no significant association between formal education and ways in which herders cope with risks/ uncertainty situations.

Chi-square cross tabulations was carried out to determine the relationships between the formal education of the respondents and their risk management status. Table 37 summarizes these results.

Table 37: Association between Formal Education and Risk Management

	Formal Education				
Risk mgt. status	**Illiterate**	**Primary**	**Secondary**	**Post- sec.**	**Total**
Poor	19	6	2	1	**28**
Moderate	56	53	15	26	**150**
Good	2	3	3	1	**9**
Total	**77**	**62**	**20**	**28**	**189**

(χ^2) = 15.3 at 6 df, Spearman correlation (r) = 0.232, n = 189. All were significant at P < 0.05.

From the crosstabs and chi-square results above, it shows that there is an association between formal education and better risk coping methods. This means that education makes herders understand/ acquire better survival techniques of evading and surviving risky situations without incurring so many losses as do the ordinary herders.

4.19 Relationship between Direct income, Remittances and Risk Management

Hypothesis five stated that there is no significant relationship between formal education and income/remittances and risk coping mechanisms. Tables 38 and 39 summarize these results.

Table 38: Wage income by risk management

Risk category	Income from salary/ wage		Total
	Yes	No	
1	7	21	**28**
2	75	75	**150**
3	1	8	**9**
Total	**83**	**104**	**187**

(χ^2) =10.215 at 2 df, Spearman correlation (r) = - 0.07, n = 187. χ^2 value is significant at $P < 0.05$.

From the above results it shows that those households with direct income like a salary or wages are better managers of risks associated with hardship situations. There is therefore an association between income and risk management. This can be explained by the fact that these households are able to either engage in other trades during times of hardship or because of alternative source of income, they do not depend on livestock only for their subsistence.

Table 39: Remittance by Risk Management categories

Risk category	Remittance		Total
	With remittance	Without remittance	
1	17	11	**28**
2	101	47	**148**
3	7	2	**9**
Total	**125**	**60**	**185**

(χ^2) =1.059 at 2 df, Spearman correlation (r) = - 0.075, n = 185. All were not significant at $P < 0.05$.

From the above analysis results it shows that there is no association between remittance and risk management. This could be true since very few families get it and the amounts mostly received are not significant to make a big difference in families way of living.

There is also the question of regularity in receiving these remittances. Of the total of 56 who receive about 55 % of them do not receive it regularly.

4.20 Sample means levels of herders with Formal Education and those without in Assets Diversification and Livestock Management

Hypothesis one states that education does not lead to investment in livestock classes, types, and number of livestock, while hypothesis one and two state that statistically there is no difference in investment in livestock management and diversification of assets between herders with formal education and those without. To test these hypotheses, it was assumed that educated herders do not invest more in management and have not diversified their assets more that those without.

a) For investment in management, mean level of expenditure of the samples are compared. The assumption behind this prediction is that households with formal education invest more on average in management of livestock than those without. Tests were carried out and the results are summarized in Table 40.

Table 40: Test for difference in Livestock Management (One sample test) by level of education

	Test value = 0			
	t	df	Sig. (2-tailed)	Mean Difference
Investment with no education	3.681	80	.000	3403.7
Investment with education	7.804	113	.000	9304.2

The table above shows that there is a statistically significant difference in investment in livestock management between herders with formal education and those without it. The difference is due to the fact that herders with formal education seem to spend a

substantial part of their income in buying of treatment drugs and hiring of labor that takes care of the stock.

b) For diversification of assets the mean number of assets owned by the groups were compared. The assumption behind this prediction is that households with formal education diversify their assets more than those without. Tests carried out on these means comparison are summarized in Table 41.

Table 41: Test for difference in Assets Diversification (one sample test) by education

	Test value = 0			
	t	df	Sig.(2-tailed)	Mean difference
Assets diversity without education	19.736	80	.000	4.4
Assets diversity with education	40.203	114	.000	6.7

The table shows that there is a statistically significant difference in assets diversification between herders with formal education and those without. Those with formal education have diversified their assets more than those without it. The possible reasons for the difference could be due to the fact that those with education are able to buy other assets, or due to awareness of risks involved with livestock keeping. They see a need to diversify into non-livestock assets.

CHAPTER FIVE

5.0 SUMMARIES, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summaries and Conclusions

The purpose of this study was to find out how formal education influences risk management among the pastoral herders of Baringo District- the Il-chamus. The traditional way of life among this community seems to have changed significantly especially after the introduction of the formal education. Their traditional production systems for subsistence were mainly aimed at producing milk, meat, fat and blood, which were consumed directly and indirectly through sales. However, this production system seems to have either changed or other food sources have been acquired such as agriculture and conventional market trading. Those who have acquired formal education have been employed, and therefore depend on this form of income for their subsistence other than livestock produce and products. This trend could be attributed to increased awareness among the people, influence of other communities, population increase, diminishing grazing lands and persistent droughts which have continued to wipe out livestock in the past recent years. There are three major risks facing this community: drought, famine and livestock diseases. Two hundred and ten randomly selected herders formed the main subjects of this study. The population was first stratified into two, those with formal education and those with none. The data was analyzed using descriptive statistics, chi-square and t-test for test of the hypotheses. On Education levels it was found out that about 76% of the population has education below secondary level i.e. illiterate to class 7 (8) level, while only about 23.8% have attained secondary level and above. This certainly shows that literacy level in the community was still very low

compared to national standards, where it is approximated at over 50% of the population have attained some level of literacy.

Analysis of the data showed that most of the hypotheses tested using chi-square yielded significant results. Therefore a relationship/ association was established between formal education and risk management. The study also revealed that education influences diversification of capital assets, investment in livestock management, but has no influence on the quality of livestock kept and livestock species diversification.

In this study, correlation analysis was done to provide a closer assessment of the closeness of relationships between formal education and assets diversification, livestock diversification, quality and quantity. The t-test statistic was done to determine the means difference in investment in management and capital assets diversification between those herders with formal and those without formal education. This showed that educated herders spent lot of money in management and they also diversify their capital assets.

In conclusion, it has been recognized in the past that the Il-chamus community were nomadic pastoralists whose subsistence centrally dependent on livestock for all their undertakings. However, this study had revealed one key issue, that provision of Education had influenced their forms of production and subsistence. Only about 28.6% of the population said to rely solely on livestock. The rest of the population mixes various forms of production such as farming, trading, wage employment and informal employment practices among others. All these are attributed to formal education. Therefore one can comfortably, from the findings of this study conclude that Il-chamus are not longer 'pastoralists' *per se* but a mixed production economy community.

5.2 Recommendations

The findings of this study are to benefit government policy makers, researchers in Academic institutions and the pastoral communities in Eastern and Central Africa.

5.2.1 Education

Importance of formal education cannot be over emphasized. This study has revealed important influences that education has in general development of a society. It is upon the beneficiaries, government institutions and other interested groups like the NGOs to use available resources within their means to try to expand education facilities among the general pastoral communities of Eastern Africa. This can be achieved through creation of closer links with these communities. Of course a good number of them have understood the importance of education, but may be willingness to surrender children in place of herding to go to school or poverty levels are too high among them (this study has shown this) and as such hinders education efforts. This study can be very useful indicator to the pastoral communities on the need for them to embrace education fully.

5.2.2 Livestock Investment

This can be looked in three different perspectives: - investment in management (hired labor, drugs, farm structures e.t.c.), investment in livestock quality (acquisition of high valued exotic animals) and investment in animal numbers (accumulation of wealth through keeping of large herds). From this study it revealed that formal education influences investment in management of livestock. This study therefore recommends this as a positive move. The relative proportion of livestock holding analysis in this study shows that livestock species are less diversified. They are restricted only to local Zebu,

small East African goats, Red Maasai sheep and a few camels and donkeys. Trying to introduce high valued breeds or keeping very large herds may prove to be disastrous given the fragile environmental conditions. This study recommends that the community should be left to continue keeping the local adapted breeds and maintain the low numbers, which the resources can support.

5.2.3 Assets Diversification

The Il-chamus production system is poorly diversified in terms of assets. People therefore lack in alternative sources of income when livestock systems collapse especially during drought time or when there is a disease outbreak and quarantine measures have been instituted. From the findings of this study, education was seen to influence assets diversification. Those with education seem to have more capital assets than those without it. Any factor that promotes assets diversity should be encouraged so that people can have an alternative means to supplement and compliment livestock income. Education here is highly recommended as a long-term strategy for sustainable pastoral development. The government and NGOs can assist in this through identification of alternative income generating activities that can provide other forms of subsistence to pastoral communities. From the researcher findings, recommendation is made for the land to be sub-divided, this may enhance a better management of natural resources in this area.

5.2.4 Remittance

It was assumed in this study that households' members employed and working away should be able to send some form of remittance to their relatives. The remittances could be in various forms such as money (cash), building materials, farm tools, and clothing

e.t.c. These could ease a stress that a household may be having due to hardship conditions, though remittance will depend on individuals and their relationships with other household members. This study recommends that people working away should be encouraged to send more remittance of any form to those living in their rural homes.

5.2.5 Risk Management component

Risk management is a new component/ concept in the pastoral management systems. It therefore needs to be reviewed as often depending on geographical location and incorporated into the general pastoral management systems. This should be done to equip those who deal directly with pastoralists with latest techniques and skills that they can sell to the communities they are dealing with. Pastoralists themselves need also to be taught through seminars, local chief *barazas,* and workshops on the importance of risk management skills and how important they are to them. People often have accused pastoralist wrongly may be, as being non-conformists group since drought after drought, they still go back to the system even after being hit badly. This could be true but what else are they expected to do if they lack in knowledge on how to tame their environment and modern techniques of production- be it of animal or crop or the modern market economy for that matter. The government institutions concerned and NGOs can achieve this by creating awareness among the pastoralists.

5.3 Future research

This study produced basic information on Influence of Formal Education on Livestock and Assets Diversification Among the Il-chamus Community.

Important issues for future research includes;

1) The Il-chamus community seems to be departing from traditional subsistence pastoral economy to a market oriented economy. It would be useful to see how this process impacts education and its implication in the general community set up.
2) Diversification into non-pastoral economy activities may require further study. How would this affect existing traditional institutions?
3) How would the local community benefit from the spread of formal education?
4) Follow up research using smaller samples and multiple sites on what would be the socioeconomic and cultural impacts of diversification and education among the people. Who benefits the most and who loses if any (i.e. the educated person, his/ her family, or the community in general)?

REFERENCES

Action Aid/ Oxfam. (2000). Education for all: a compact for Africa; in Adult Education and Development. Ed. Heribert Hinzen. No. 54. PP 144- 156.

ADB/ AERC/ GCA/ UNECA/ WB. (2000). Can Africa claim the 21st century? The World Bank, Washington D.C.

Bogonko S. N. (1992). A History of Modern Education in Kenya (1895-1991). Nairobi. Evans Brothers (Kenya Ltd.)

Bohrnstedt, G. W. and D. Knoke (1982). Statistics for social data analysis. F.E. Peacock publishers, inc. Itasca, Illinois.

Bray M, P. B. Clark and D. Stephens (1986). Education and Society in Africa. London. Edward Arnold Ltd.

Coppock, D. L. (1994). The Borana plateau of southern Ethiopia: synthesis of pastoral research, development, and change, 1980- 1991. System study No. 5. International Livestock Center for Africa, Addis Ababa, Ethiopia.

CPK (Colony and Protectorate of Kenya). 1926 Annual Report, Kerio Province. Nairobi: Government Printer.

Dundas, K. R. (1910). Notes on the Tribes Inhabiting the Baringo District, East African Protectorate. Journal of the Royal Anthropological Institute 40: 49-72

Fine, J; W. Samuel, C. Marcelina, M. Foster, R. Hooper, and K. Ibrahim (1999) The Tanzania Education Sector Development Programs: Appraisal of Financial Planning and Management Review Team Final Report. African Economic Research Consortium, Nairobi; Kenya.

Galaty, J. and D. J. Johnson (1990). The World of Pastoralism: Herding Systems in Comparative Perspective. The Guilford press, New York. N.Y. Belhaven press, London, England.

Glewwe, P. (1991). Schooling, Skills, and the returns to government investment in Education. An exploration using data from Ghana. Washington. Working paper no. 76.

Helland, J. (1997). Development Issues and Challenges for the future in Borana. A report prepared for Norwegian Church Aid, Ethiopia, Chr michelsen institute, Bergen Norway.

Hinkle, D. E, W. Wiersma and S. G. Jurs. (1979). Applied statistics for the behavioral sciences. Rand McNally college publishing/ Chicago.

Holland, K. (1992). The diversification of a pastoral society: education and employment among the Maasai of Narok district, Kenya. Unpublished Ph.D. dissertation. McGill University. Montreal.

Holland, K. (1996). The Maasai on the Horns of a Dilemma: Development and Education. Nairobi. G. S. Were press.

Huntingford. G. W. (1953). The Southern Nilo-Hamites. London: International African Institute.

Ishumi, A. G. M. (1994). 30 years of learning Educational development in Eastern and Southern Africa from Independence to 1990.Nairobi. International Development Research Center.

Kennedy, P. (2000). Global Challenges at the Beginning of the Twenty- first Century; in Adult Education and Development. Ed. Heribert Hinzen. No. 54. PP 25.

Kenya, republic of, (1984). Baringo pilot semi-arid project: Parts 1&2. Ministry of agriculture- Marigat.

Khandker, S.R. Education Achievements and School efficiency in rural Bangladesh. Washington. World Bank discussion papers 319.

Khandker, S.R; V.Lavy and D. Filmer. Schooling and Cognitive Achievements of children in Morocco. Can the government improve outcome? Washington. World Bank discussion papers no. 264.

Kituyi, M. (1990). Becoming Kenyans: Socio-Economic Transformation of the Pastoral Maasai. Nairobi. African Center for Technology Studies.

Kjaerby, F. and W. Baynit. (1979). The development of Agro-pastoralism among the Barabaig in Hanang District. Bureau of Resource Assessment and Land Planning, Research Paper No. 56, University of Dar-es-Salaam.

Knight, J. B, and R. H. Sabot. (1990) Education, Productivity and Inequality: The East Africa Natural Experiment. New York: Oxford University Press.

Knoczacki, Z. A. (1978). The Economics of Pastoralism. A case study of Sub-Sahara Africa. London. Fank Cass and Co.

Levin, R.I. and D. S. Rubin (1991). Statistics for Management. Fifth edition. Prentice Hall, Englewood Cliffs, New Jersey 07632. USA.

Little, P.D. (1992). The Elusive Granary. Herder, Farmer and State in Northern Kenya. New York. Cambridge University Press. African studies series 73

Moris J. R. (1988). Failing to cope with drought: the plight of Africa's ex-pastoralists. development policy review 6: 269- 294.

Narman, A. (1990). Pastoral Peoples and the Provision of Educational Facilities. A case study from Kenya. Nomadic peoples, No. 25-27, pp 108-121.

Noor, A. (1981). Education and Basic needs. World Bank staff working paper no. 450. Washington. The World Bank 1818 H street, N.Y., USA.

Otiende, J. E, S. P. Wamahiu and A. M. Karugu. (1992). Education and Development In Kenya: A Historical perspective. Nairobi. Oxford University press.

Oywaya, A. M. (1995). Socio-economic factors that influence the participation of women farmers in agriculture extension programs in Mulala division of Makueni district of Kenya. Masters thesis; Egerton University.

Psacharopoulos, G. (1994). Returns to Investment in Education: A Global Update. World development 22 (9): 1325- 43.

Kenya, Republic of, (1998). Statistical Abstract. Central Bureau of Statistics. Ministry of Finance and Planning.

Kenya, Republic of, (1979). Narok District Development Plan 1979-1983. Nairobi. Government printer.

Kenya, Republic of, (1997). Baringo District Development Plan 1997-2001. Nairobi. Government printer.

Otiende, J. E. *et al* (1992). Education and Development in Kenya. Nairobi: Kenya Literature Bureau.

Rigby, P. (1980). "Theoretical Implications of Pastoral Development Strategies in East Africa." In Galaty, J. G. et al. The future of pastoral peoples. Proceedings of a conference held in Nairobi; Kenya, 4-8 Aug 1980.

Roth, E. A. (1991). Education, Tradition and Household labor among Rendille pastoralists in Northern Kenya. Nairobi. Human organization 50.

Ruminations (1998). Newsletter of the small ruminant/ global livestock collaborative research support program. Fall 1998, California. 95616,USA.

Sena, S. Ole (1986). Pastoralism and Education: "School participation and social change among the Maasai" unpublished Ph. D. Dissertation, McGill University, Montreal.

Solomon, D. (1999). Diversification of Pastoral Assets for Risk Management in the Borana pastoral system of southern Ethiopia. Ph. D. dissertation. Utah state university.

Strauss, J. (2000). Household and Community Factors Affecting Investment in Human Development in Africa. Michigan State University, Department of Economics, East Lansing, Mich.

Thom, D. (1978). The Human and Social Characteristics. Kenya Marginal/Semi-Arid Lands Pre-Investment Report No. 6. Nairobi: ministry of agriculture.

Thompson, J. (1885). Through Maasai Land. London: Cass.

UNICEF (United Nations Children's Fund). (June 1993). Baringo Baseline Survey Report.

Van der Gaag, J. and Wim Vijverberg (1978). Wage determination in Cote d'Ivoire. Living standards measurement study working paper 33. World Bank, Washington, D.C.

Vossen, R. (1978). Linguistic Evidence Regarding the Territorial History of the Maa-speaking peoples: Some preliminary remarks. Kenya historical review 6: 34-52

Weatherby, J. M. (1967). Nineteenth Century wars in Western Kenya. *Azania* 2: 133-144

Webster, A. (1990). Introduction to the Sociology of Development. Second edition. The Macmillan Press Ltd. London.

Widstrand, C. G. (1975). The Rationale of Nomad Economy. Ambio.4 (4).

APPENDIX 1. SURVEY QUESTIONNAIRE

INFLUENCE OF FORMAL EDUCATION IN INVESTMENT ON LIVESTOCK AND ASSETS DIVERSIFICATION AMONG THE IL-CHAMUS COMMUNITY OF BARINGO DISTRICT.

NAME OF INTERVIEWER_____

DATE_____

PREPARED BY:

LENACHURU CLEMENT ISAIAH
DEPARTMENT OF NATURAL RESOURCES
FACULTY OF ENVIRONMENTAL STUDIES AND NATURAL RESOURCES
EGERTON UNIVERSITY

MAY, 2000

1. **Household information- location**
   division----------location----------sub-location----------
2. **Personal information**
   Name (optional)---------- **sex:** male/female
   Marital status: married/single/widow/widower/separated **age:----------yr.**
3. **Education.**

Years spent in school	Level of attained	Year of completion
None	_____	_____
Primary level		
Secondary level		
High school		
Middle colleges		
Graduate level		
Postgraduate level		

Employment: are you employed? 1. Yes 2. No
What kind of employment: 1. Formal (salaried/waged) 2. Informal (self-employed)
Remittances: that part of income that is send home to be used by family and relatives.
What do you do with your salary and other incomes every month?

Uses of income per month	circle	Total per month in Kshs
Invest into business	Y N	
expenditure on health	Y N	
Expenditure on cloths	Y N	
Expenditure on food	Y N	
Expenditure on education	Y N	
Expenditure on hired labor	Y N	
Expenditure on livestock health	Y N	
relatives	Y N	
savings	Y N	
Others (specify)	Y N	

Remittance recipient. Do you receive remittance from relatives working out? 1.Y 2.N

Relative	Amount per month/ year in Kshs	Uses
1st		
2nd		
3rd		
4th		
5th		

Activities that are Sources of income

Do you receive income from any of the following sources on daily basis?

Source of income	circle	If yes amount earned
Salary labor	Y N	
Wage labor	Y N	
Sale of cattle	Y N	
Sale of sheep	Y N	
Sale of goats	Y N	
Sale of milk	Y N	
Sale of firewood	Y N	
Sale of charcoal	Y N	
Sale of hides & skins	Y N	
Craft sales	Y N	
Trading	Y N	
Others (specify)	Y N	
TOTAL		

Livestock investment.

Do you own any livestock: 1. Yes 2. No

Describe your current herd size and changes since last two seasons (wet & dry)

Type	Current #	1.sales	2.purchase	3.borrow	4.lent	5.gift received	6.inherited
Cattle							
Goats							
Sheep							
Donkeys							
Camels							
Poultry							
Others specify							

What are your sources of money to buy livestock? ----------

Why did you buy if you already have others? ----------

Have you purchased any of the following for your animals since last season?

Type of service	Circle	If y type	Total cost
Veterinary products	Y N		
Salt/ minerals	Y N		
Feed	Y N		
Water	Y N		
Labor	Y N		
Other	Y N		
Total	Y N		

Breeds of animals kept

Type of animals	circle	Breeds	No.
Cattle	Y N		
Sheep	Y N		
Goats	Y N		
Poultry	Y N		
Camels	Y N		
Donkeys	Y N		
Others (specify)	Y N		
TOTAL			

Have you sold any of these animals in the last dry season?

Type	Circle	If Y number sold	Total earned in Kshs
Cattle	Y N		
Goats	Y N		
Sheep	Y N		
Camels	Y N		
Donkeys	Y N		
Poultry	Y N		
Total			

Location of investment/ Assets diversification

Assets checklist:

Assets checklist	Circle	Loc. In relation to home: 1-home area 2-away	Amount invested in Kshs
House	Y N		
Store/granary	Y N		
Rental houses	Y N		
Trading premises	Y N		
Public transport	Y N		
Bicycle	Y N		
Private car	Y N		
Tractor	Y N		
Farm	Y N		
Motorcycle	Y N		
Total		# at home = # away =	

Why did you choose to invest in away from home? ----------

What drives you to diversify your sources of income?

Risks/ uncertainties faced last season:

What are the common risks/ disasters that you encounter as a herder?

Risks/uncertainties	circle	If yes, severity? Ranking 1.very severe 2.moderate 3.not severe	# animals lost	What is the recovery process?
Drought	Y N			
Famine	Y N			
Diseases	Y N			
Raiding	Y N			
Market prices	Y N			
Others (specify)	Y N			

How has diversity of assets assisted you recover from the risks/disasters? ----------

Observe and ask questions on the following

Socio-economic indicators	Observation/ responses
Food security	
State of health	
Type of shelter	
Clothing	
Fodder availability	
Livestock condition	
Water availability	
Other(specify)	

What are the common sources of food during time of crisis? ----------

---

What do you do to recover after crisis? ----------

How long does it take to recover? ----------