INFLUENCE OF GENDER AND EDUCATION ON HOUSEHOLD RISK MANAGEMENT AMONG THE HERDERS OF LOWER BARINGO DISTRICT, KENYA

By

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DECLARATION

This research thesis is my own original work and has not been presented to this University or any other University for an award of a degree.

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DEDICATION

To my beloved wife, Anne Jerotich; children, Peter Keya, June Rachel Awuor and Mark Millard.

ABSTRACT

In pastoral systems, mobility and other forms of traditional value systems have been used over the years to overcome environmental risks such as drought, diseases and famine. Change in pastoral production from traditional to modern systems has led to a new paradigm of thinking and adapting to new systems of values.

This research examined the impact of gender and education on household pastoral risk management through labour export, remittance and income diversification.

This study was conducted among pastoral communities (the Ilchamus and the Tugen) living in Marigat Division, lower Baringo District. The sample size consisted of 206 household heads, randomly selected for interview, of which 148 and 58 households belonged to Ilchamus and Tugen respectively, and 132 and 74 household heads were male and female respectively.

The data was collected through a sociological inquiry, using a survey design, and enriched by small group discussions, personal observation and information obtained from key informants. Descriptive analysis (Frequency distributions: means proportions and percentages) was used. Analytical analysis (Chi-square) was used to test hypotheses. Statistical Package for the Social Sciences (SPSS) programme was helpful in the analysis of data.

The results show that income diversification contributed more in explaining variances in pastoral risk management. Other variables such as education level, labour export and remittances only explained slightly, changes in risk management. Good risk management was found in households with higher education level, more labour export

and high remittances. Male households were better in managing household risks than female households. Males were more educated and more in labour export than females. Tugen households were found to be better in managing risks than Ilchamus households, but the difference was not statistically significant. Female households, although disadvantaged, were more involved in sustainable income generating activities than male households.

The study recommends that, for more sustainable household pastoral economy, herders especially women should be economically empowered. Practical education addressing pastoral needs and creating awareness of sustainable household economic production through income diversification should be enhanced. The policy makers, development planners and stakeholders should put more emphasis on sustainable pastoral development.

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CHAPTER ONE

INTRODUCTION

1.1 Background Information

Agriculture, is the mainstay of Kenya's economy. However, only 20% of the total land is arable, while 80% of the land is under arid and semi arid lands (ASALs). Any agricultural development in the ASALs is subject to risks like frequent droughts, water unreliability, livestock diseases, cattle rustling, ethnic clashes and human diseases (Dankelman, & Davidson, 1988). Economic production in the drylands is represented by livestock keeping and marginalised crop farming (Barrow, 1996).

For a long time the pastoral communities had a vast indigenous knowledge of their environment and they put in place survival strategies, which were passed from generation to generation. The traditional knowledge has since been replaced with the modern knowledge that is disadvantageous to the pastorals way of life (McCorkle & Mathias-Munday, 1992).

During the colonial era the traditional subsistence economy was replaced by cash economy. The new economic system brought alongside modern methods of agricultural practices (McCorkle & Mathias-Munday 1992). Planned pastoral projects were introduced to the pastoralists by the colonial government without the involvement of the farmers at grassroots or national levels. This top to bottom approach, aimed at improving pastoral lifestyle, failed due to the fact that planners and policy makers ignored the pastoralists and perceived them as uneducated. The projects were also

designed with men in mind and did not relate to women, yet women form almost 50% of the population. Women are directly involved in every level of household economic production (Were, 1985).

Lack of educational facilities and gender imbalance in education are some of the problems facing the agropastoral communities. Education is recognised as a key factor in sustainable development (Fatau, 1987). There is no gender imbalance in education in pastoral communities, in that boys were more favoured than girls, because traditionally, girls were more involved in household chores. This leaves them with little time for schooling.

Women are the first environmental educators as they are in contact with the young ones in early stages (Jowkar, 1994). This means that, in the early developmental stage, children learn more about the environment from their mothers compared to their fathers. Women also disseminate information faster in women groups concerning developmental and family welfare issues. Educating women will empower them by giving them skills in economic production. In other regions of the world most of the entrepreneurships, like petty trading, are done better by women (Sivard, 1985).

Research in the study area identifies gender and education as factors contributing to pastoral risk management. There is little or no information on how gender and education contribute to labour export, which in turn, influences remittances and income diversification as they all affect pastoral risk management, especially at the household level in the study area (Little, Cellarius, Barret & Coppock. 1999).

Moreover, pastoral areas in Kenya, as well as the rest of Africa, and other parts of the Third World, have poor infrastructural networks which hinder efficient information dissemination that is needed to facilitate faster development. All the mentioned problems are obstacles to development and affect the ability of pastoralists to cope with risks (Fatau, 1987).

Baringo agropastoralists, like other pastoralists in East Africa, face risks, which have played a crucial negative role in livestock production. Research and development planning should therefore give priority to finding strategies in managing risks with the view of improving pastoral livelihoods. From the available information, it is evident that there is need to research on (i) how investment in education relates to household assets, particularly the livestock; (ii) the use and distribution of remittances within the household members and its effects on economic diversification; and (iii) gender role in household income diversification. All these factors relate to pastoral risk management, the subject of this thesis.

1.2 Statement of the Problem

The major problems facing the Baringo agropastoralists (Ilchamus and the Tugen) are the risks such as droughts, human and livestock diseases, famine, ethnic clashes, and cattle rustling. Due to prevalence of risks, the pastoralists are losing pastoral assets such as land and livestock to encroaching deserts, settlements, drought and livestock diseases. These risks have forced the herders to depend on relief food,

food for work programmes and other forms of aid from the government and donors since 1926 (Little, 1999). High government and donor expenditures on relief aid and food for work programmes have played little role in pastoral development. Developmental interventions among the Baringo herders included education, which was expected to facilitate the pastoralists to manage risks through interactive employment, diversification of income, and sending remittances to the households if employed away. Empowering women through education and employment was expected to set forth-similar effects on management of risks. Unfortunately, these efforts have not been seen to yield fruits, and pastoralists are still left to the mercy of the risks. The reason is that, there is lack of improved educational facilities and diversification of household income through gender empowerment, labour export and remittance.

1.3 Broad objective

This study was to investigate the influence of gender and education on labour export, the consequent remittances and income diversification with the view of establishing their effects on pastoral risk management among the herders in Marigat division of Baringo district.

1.4 Specific Objectives

The two specific objectives addressed were:

1. To examine how education level of household members influences the level of household risk management through labour export, remittance, and income diversification.

2. To examine how gender of household members influences the level of household risk management through labour export, remittance, and income diversification.

1.5 Hypotheses

Eight hypotheses were tested in this study. These are constituted by six variables referred to in the specific objectives (presented in section 1.4) and the conceptual framework model (presented in section 2.7 and discussed in subsection 2.7.1, figure 1). These are namely:

Hypothesis 1: There is a relationship between gender and pastoral risk management (in that males are able to manage risk better than females).

Hypothesis 2: There is a relationship between education level and pastoral risk management (in that the more educated pastoralists are able to manage risk better than those less or not educated).

Hypothesis 3: There is a relationship between labour export and pastoral risk management (in that households with more people working and temporarily settled

away from the households tend to manage risks better than those households with less or no people working and temporarily settled from the households).

Hypothesis 4: There is relationship between gender and pastoral risk management, through the influences of labour export (in that households that send more males as labour export tend to manage risks better than households that send more females as labour export).

Hypothesis 5: There is a relationship between education and pastoral risk management, through the influence of labour export (in that more educated households will tend to send more members as labour export and will thus manage risks better than the less educated households).

Hypothesis 6: There is a relationship between education and pastoral risk management, through the influences of income diversification (in that the more educated households tend to diversify their income sources and so tend to manage risks better than the less educated households).

Hypothesis 7: There is a relationship between labour export and pastoral risk management, through the influences of remittances sent back to the households (in that households that send more members as labour export will tend to receive more remittances and will tend to manage risks better than households that send less or no members as labour export).

Hypothesis 8: There is a relationship between labour export and pastoral risk management, through the influences of income diversification (in that households that send more members as labour export will also tend to diversify their incomes, and so manage risks better than households that send less or no members as labour export.

1.6 Justification

For a long time, pastoral communities have relied on traditional knowledge in the management of risks. The traditional knowledge such as herd maximisation, herd loaning, mobility, and herd diversification are no longer useful in the management of household pastoral risks. This is because the pastoralists have lost most of their grazing lands to other land uses (settlement, wildlife and cultivation) and population pressure. The Baringo herders have experienced reduced land size. So mobility is therefore, difficult, since other land uses and economic activities have taken over from pastoralism. The management of pastoral risks requires the agropastoralists to learn and adopt new mitigating strategies that are practicable to the environment and to the changing pastoral lifestyles. Income diversification labour, export and remittance are the ways, which, pastoralists can adopt to increase household assets and reduce the risks that face them. Gender and education are considered to be the key variables that influence the management of household pastoral risks through labour export, remittances, and income diversification. The role of gender and education as they affect household pastoral risk management has been little studied in Baringo area. Little information is available as to how investment in education has affected income diversification especially livestock assets at household level. There is lack of information on the role of gender in the pattern of household economic diversification, especially distribution of remittances as they affect household pastoral risks (Little, 1999).

A number of methods used in research to mitigate pastoral risks management have not yielded practicable results in solving the problems facing the Baringo agropastoralists. The research therefore addressed practicable strategies in mitigating pastoral risks. It also provided useful information to the government and stakeholders in policy-making decisions, recommendations and implementation of pastoral risk strategies. It is postulated that sustainable mitigating pastoral risk strategies such as income diversification labour export, remittance through the influence of gender and education level will alleviate poverty of Baringo herders. The same mitigating strategies will provide insight into other sustainable methods of household production and will be useful in other pastoral communities in Kenya.

1.7 Definition and Operationalisation of variables

Gender: Refers to the two sexes, emphasising on the roles of the male and female household heads. The dummy variable is coded Male =1, Female =0

Education: Highest level of education reached by the household members.

Table 1: *Scores on Household Education Level*

Education level	Score
Illiterate	0
Primary I –4	1
Primary 5 – 8	2
Secondary	3
Post secondary	4

Labour export: Number of household members that have migrated, working and temporarily settled away from home.

Remittances: Total amount of money brought to the household from outside employment per year. Remittance index = Total amount of remittance sent into the household per year divided by household size (i.e. number of people in the households).

Table 2: *Scores on Household Remittances*

Amount remitted (Ksh)	Score	Description
0	0	No remittance
1 – 10000	1	Low remittance
10001 –20000	2	Moderately high remittance
20000 +	3	High remittance

Income diversification: This is defined as the number of sources of income per household.

Table 3: *Scores on Number of Sources of Income*

Number of Sources of Income	Score	Description
0 –3	1	no or few income sources
4 –7	2	moderate income sources
7 --10	3	high income sources

Pastoral risk management: The ability of a household to cope with risks, such as drought and livestock diseases, using various coping strategies. It was made into an index constituted by the following indicator variables: Pastoral risk management index = drought management index (migration + destocking +

buying and storing fodder + lending out) + Famine management index (food aid + sale of livestock + use salary/wage to buy and store food + use of income from other business to buy food) + disease management index (use ethnoveterinary / buy drugs + modern veterinary services + selling livestock) + livestock conditions. Total index scores were made for each household.

Table 4: *Pastoral Risk Management*

Category	Score	Description
0	0	No risk management
1 -15	1	Low risk management
16 -25	2	High risk management

Matatu ------Small vehicles used to transport people for business

Jua-kali ----- Small scale factories for manufacturing consumable goods.

1.8 Limitation of the Study

- Financial constraints forced the researcher to concentrate on the two communities Ilchamus and Tugen and not Pokot who also occupy the study area on the northern periphery.

- During the research, most of the homesteads were deserted due to severe drought, which had hit the study area. Many household members migrated to other areas with pasture and water making it difficult for sampling procedure and

collection of data. But to a very large extent, this did not affect the quality of data collected.

CHAPTER TWO

LITERATURE REVIEW

2.1 The Arid Ecosystems and their Problems

Eighty percent of Kenya is under arid and semi- arid ecosystems where agro-pastoral and pastoral communities live. The economic activities in these dry lands are livestock production and subsistence crop farming. Pastoralists concentrate mainly on livestock keeping while agropastoralists practise sedenterised farming (Barrow, 1996).

The arid lands of Kenya experience risks such as frequent droughts, famine, disease outbreaks and cattle rustling. These pastoral risks have severely affected livestock production. Pastoral lifestyles for a long time have revolved around subsistence economy. Recent changes in world economy, frequent droughts, reduced pastoral land size through encroachment of agricultural activity, high population growth rate and socio-cultural changes have forced the pastoralists to change their lifestyles and adopt new knowledge of managing risks in the harsh environment in which they live (Barrow, 1996).

The move from the pastoral existence to a settled cash economy lifestyle has had a negative impact on the lives of many inhabitants of arid and semi-arid areas. Women are particularly disadvantaged in that women headed families in such dry settlements are often among the poorest as they may have lost the support of the traditional system of pastoral production.

The effect of settlement and urbanisation greatly affected pastoral economy (Dankelman & Davidson, 1988). For dry-land management of pastoral risks, a number of important implications on the gender role have emerged that is, equal involvement of men and women at all levels in planning, extension and implementation. This means the following: women and men have the same access to inputs, both technical and non-technical extension such as advice, credit, training and education. Education promotes herders awareness and participation and gives skills in a wide variety of activities and helps them understand their potentials and constraints especially women. (Barrow, 1996).

The role of gender is critical to the survival of dry land areas. Gender issues and policy have to recognise that women and men play different social roles hence have different needs. The government policies should address key important issues in gender balance such as education, labour force, income diversification, credit facilities and land tenure. Such factors have affected gender role and have impacts on management of pastoral risks. Education creates environmental awareness and gives one, skill to utilise the resources with effectiveness.

Male migration to urban centres to seek employment has made women to assume increasing responsibilities in household management. The remittances from household members in urban areas have played an important role in the diversification of household income. Money earned from employment is used in livestock investment, education, clothing, housing and other income generating activities (Palmer, 1991).

2.2 The Baringo Herders

The IIchamus are agro-pastoralists who keep livestock as the main economic activity besides growing crops. Frequent droughts and famine experienced in the area have made Ilchamus almost entirely dependent on relief food, food for work and subsidised barter programmes since 1926 (Little, 1992). The herders always wait upon the donors and the government for their survival.

Tugens are also agropastoralists who keep livestock and grow crops such as millet, maize and beans. The work carried by Vedeld & Luseneka, (1991) show that 93% of the households own livestock and 99% cultivate grains. 67% of the households are involved in off-farm activities such as salaried work, kiosk, matatu business, tailoring, casual work, charcoal burning/firewood sales, hides and skin, honey sales and jua kali.

In Baringo, the herder - cultivator is a risk-mitigating strategy without sufficient attention to climatic and ecological constraints in different sites. Income diversification is one of the factors seen as a means of survival in this pastoral area, but the diversification depends on several variables such as gender, education, labour export, wealth of the households, distance from the town and infrastructures (Little, 1992). Remittances and income diversification as influenced by other variables affect risk management and need more studies (Little *et al.*, 1999). It is most likely that household members employed far from home send back money, which is used to

increase household assets and to diversify income. Most of these labour export have good education backgrounds to help them secure well paid jobs.

The money they remit is invested in livestock. Information on how much is invested in education and how this relates to investment in livestock is lacking (Little *et al.*, 1999). It has been noted that there was reduction in per capita livestock holdings of about 40% during 1978-1990 due to frequent drought, reduced land size and engaging in other household production (Little, 1992). With declining per capita holdings, many herders had to diversify their income. The degree of household income diversification since 1990 has not been studied. The biggest gap in the understanding of the role that diversification plays in risk management are the gendered nature and level of education. Little data exists on how pastoral investment in education relates to success in labour market and how it affects herder responses to droughts and other disasters (Little *et al.*, 1999).

2.3 Pastoral Risks

In arid and semi arid regions agriculture is limited due to harsh environmental conditions. The pastoralists' lifestyles depend entirely on livestock and, to some extent, on subsistence crop farming. In order to improve on their economic production, there is a greater need to manage the risks. Over 40% of the pastoralists' depend on aid from the government and other agencies for survival (Bezuneh & Deaton, 1997). Risks such as famine, droughts and livestock diseases are common and cost pastoralists livestock (Little *et al.*, 1999).

Every pastoral household must seek strategies in managing risks such as diversification of their income, educating their children, looking for better employment outside and balance in gender roles. Little (1985) stated that education plays an important role in household income generating activities, which would result in risk management improvement.

2.4 Gender Role in Management of Pastoral Risks

Gender is both an essential and critical variable in the development equation because when the gender variable is ignored in development planning, the development equation is underdetermined (Clark & Rae, 1989). In essence, gender balance in development involves participation of both women and men and equal distribution of resources between them. Gender balance means increasing the visibility of women's roles in relation to men's so that their productivity can be tapped for the improvement of household production (Rao & Cloud, 1991).

There is evidence that women enhance their nation's economic growth and income through the amount and nature of their participation in reproductive (child bearing) and productive (income generating) activities (Goldin, 1986). The Goldin's analysis is found in the developing countries where economic growth has been due to women's labour force.

In Latin America, women's participation in economic activities has been increasing rapidly since the early 1980's. Women outnumber men in the urban informal sector or domestic service and in rural areas they tend to be involved in the ill-

measured low resources sector. In less developed countries in rural Africa, women generally have strong provider obligations. They accomplish these via low resource farming and small-scale trade (Clark & Rae, 1989).

In Africa, women have always played a central role in societies. The role of women in the economic development of the African continent warrants a comprehensive and critical analysis. This is because women account for over 50% in the rapid economic development of any country at all level (Were, 1985). Among the many important areas and activities where women's contributions are critical and in need of research are; agriculture, rural development, labour force, education, trade, healthcare etc. (Were, 1985).

In Kenya, it is a well-documented fact that women play a crucial role in the development of any society (Masinde, 1987). It is not enough to talk about economic development without women. Women are the main actors in development activities in rural Kenya. Since women play a crucial role in development, it is therefore, important to formulate and implement appropriate measures to keep gender balance in development by giving them morale and motivation through support in achieving education, technical skills, trade, employment, etceteras. It is clear that the introduction of modern technology and cash crops in developing societies benefited men rather than women by creating a productivity gap between them (Masinde, 1987).

In pastoral projects, women are rarely explicitly considered as actors. All development programmes for women emphasise primary healthcare, literacy and handicrafts but do not fully cover women's concerns. The incomes generated by

women's pastoral activities attract less attention than those generated by men (Jowkar, 1994).

Where males have migrated into urban centres to look for employment, women have assumed increased responsibility for managing household production in addition to gathering of food, fuel wood, fetching water and range resources.

In more traditional pastoral societies there is a greater complementarity between men and women and their economic roles. This was based on respect for shared responsibility in the division of labour. However, these change when pastoralists settle and become involved in the cash economy, which is controlled by men (Barrow, 1996). The change from subsistence to cash economy and sedentarisation requires that both men and women play equal roles in order to manage pastoral risks (United Nations Food and Agriculture Organisation UN, FAO, 1989). In settled areas, women may become involved in economic activities such as charcoal production and fuel collection for sale, which have negative environmental concerns. A case of Turkana women shows that they play a significant and important role in household economy. They have a deep understanding of the environment and the natural resources (Barrow, 1996). In the Turkana pastoral ecosystems, 25% of the total food comes primarily from wild plants. Yet pastoral development projects emphasise livestock to the virtual exclusion of off-farm food. The more important issues of coping with risks and drought through a variety of production niches are ignored (Ellis, *et al* 1987).

Factors, such as gender, education, labour export, remittance and income diversification that contribute in the management of pastoral risks in Baringo district are discussed in chapter four.

2.5 How Gender and Education Contribute to Risk Management

What is good for women is also good for the society at large. World-wide female education is generally associated with: (a) later age of marriage; (b) lower fertility; (c) lower infant and child mortality; (d) improved health for the family and better nutrition; (e) greater participation in the measured, waged, modern sector labour force; (f) increased earnings; (g) and increased national development (Sivard, 1985). Female education, therefore, plays a crucial role in the management of natural resources and improved economic growth. The expansion of national growth and development is associated with both higher levels of female education and a lower disparity in the proportion of males and females in school. A closer examination of the education of both males and females is still low due to poverty in dry land areas but it is lower in girls than boys. Life is more secured in households where both women and men are educated than in households where few or no women have gone to school (Sivard, 1985).

Education and training is a dynamic tool of interaction and a powerful means of women's participation in the management of resources (Barrow, 1996). Special training can revive and strengthen traditional skills, and build upon their enormous fund of indigenous knowledge transforming it into a capacity for action. Education

increases women's role in savings, employment and their confidence and diversifies their household income, a tool of managing risks (Ward & Dubos, 1972). Women should be used in extension services and implementation of planned projects if such projects have to succeed, because women are the best communicators of new information to other women (Ward & Dubos, 1972). Governments around the world and especially in developing countries like Kenya need to reassess their educational policies to make education be more practical oriented especially in pastoral areas (Ward & Dubos, 1972).

2.6 Combined Effects of Gender, Education, Remittance, Labour Export and Income Diversification on Pastoral Risk management

In most agricultural societies, the existence of complementarity between male and female farm activities helps to maintain diversified farming systems. Women usually specialise in certain agricultural operations like livestock or crops compatible with household duties while men concentrate on others. A dairy animal could provide milk for the household and for sale. Growing of food crops, e.g. millet, maize, fruit trees and vegetables provide food resources. Handcraft work like weaving baskets provides a source of income to the household (Barrow, 1996). In a household where the husband and wife are educated, they stand a chance of getting good employment, which, in turn, brings good income. The high income from salaries can be used to

invest in other income generating activities, for example purchasing of more animals, buying of land, constructing rental houses in urban centres and educating their children (Little *et al.*, 1999). Gender balances in education therefore, increase household income diversification.

Sivard (1985) estimates that rural women account for more than half of the food produced in the Third World. Women produce 80% of food in Africa. Women's contribution in agricultural labour is 70-80%. The informal sector may well be the main source of employment in developing countries and there are more women in the sector than men (United Nations, 1987).

Staudt (1975) found that women managed 40% of farms in Western Kenya research zone reflecting a high rate of male out-migration. Lycette (1984) shows, that women have done as well as or better than men in terms of loan performance. When women take loans, they ensure that money is spent in household productive activities. Percentage loan repayment for women is higher than men.

It has been observed by Carr & Sadhu (1988) that when the time constraints of water, firewood collection, transportation and crop processing are reduced, many women pursue income generating activities. Often, when women gain access to more water near home they increase their use of water for domestic use and any excess is for sale to invest in livestock and vegetable crops. Carr & Sadhu (1988) note that one reason women in Kitui district in Kenya cannot plough and plant on time is that half of their productive time is spent on fetching water from distant sources. Poor infrastructures like transport cause women to spend most of their productive time in

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carrying goods. If transport were improved women would use this saved time in income generating activities such as knitting, tomato growing, making of food snacks for sale, bee keeping, et cetera.

Bekele (1998) pointed out that it is predominantly women who produce, process, preserve, store and market food crops; they care for animals and fetch and carry water and firewood. They also participate in sowing, weeding, harvesting and transporting cash crops, which are the mainstay of many African economies.

Due to the worsening socio-economic risks in Africa (droughts, poverty, environmental degradation, diseases, etc) food production has dropped by more than 10%. According to Food and Agriculture Organisation (FAO) estimates, future food supplies are not encouraging. Women will therefore, be mostly affected and the quality of life conditions will deteriorate badly. In order to address food security in Africa, the management of natural resources must be fully addressed with women's role being considered as crucial in managing risks. The problem of food security is worse in agro-pastoral and pastoral areas where there are more risks, and women are marginalised. The moving from subsistence economy to cash economy and technology have caused men and women to survive by having new working relationships of moving outside their homesteads in search of employment. More men than women have moved to urban centres in search of employment to earn a living. Women are less affected because of lack of infrastructural support to carry out activities far from their living places Such migration is not compatible with childcare and traditional work on subsistence agriculture. The high rate of male's migration to towns, mines and

plantations to meet labour demand has increased women's responsibilities at the household level. In most rural households, women are the managers or household heads (Staudt, 1975).

At the same time the increased labour export to urban towns depends highly on the level of education. The highly educated men and women are employed in formal sectors where they earn high income. Some of the income is remitted back home for maintenance of the family and investments (Sofranko & Idris, 1999). Some remittances have been invested in livestock, paying of school fees, paying farm labour, buying more land and running petty trades (Little *et al.*, 1999).

The remittances have an effect on the management of pastoral risks by increasing household assets, buying and storing food to be used during droughts, improving public goods like schools, water, health centres, roads, cattle dips, etc. Since men are more educated than women, they are favoured by urban employment in the formal sector where they earn more income and hence remit more money for rural household development (Kituyi, 1990).

Pastoral livelihood will be more secured if the income base is diversified in ways which do not disrupt the pastoral economy (Barrow, 1996). National policies should facilitate decentralised small-scale enterprise and other non-pastoral productive activities in pastoral areas identified by the local organisations. The policies should be supported by gender balance in education, training, credit facilities, technical extension assistance and construction of economic infrastructures. Herd diversification, bee-keeping, crop farming, vegetable crops, employment in informal and formal sectors,

handicraft, small scale industries and entrepreneurs, charcoal burning and firewood collection for sale are forms of income diversification that would minimise risks in bad years.

2.7 Conceptual Framework

2.7.1 The Research Concept

The concept addressed by this study revolves around two important factors, namely; gender roles and educational levels that influence the ability of a household to manage risks that are characteristic of any pastoral setting, including the Baringo herders. Such risks include persistent droughts, livestock and human diseases, deficient natural resources, especially grazing, water and others.

The theory is that, empowerment of female headed households and educating households would enhance their capacity and ability to cope with the pastoral catastrophy as a way of managing the risks through the difficult seasons and times. In the context, it is believed that the empowerment of the female-headed households and the elevation of educational levels of households are exerting direct impacts on their ability to manage risks (Fig 1).

Alternative postulation is that both the empowerment of females and elevation of education in the households would influence more members of the households to solicit employment and settle temporarily away from the households, and in the process remit money to the households on a regular basis and diversify their sources of income, both of which will facilitate better risk management by the households. In

this context, the influences of gender and education on pastoral risk management are considered to be indirect.

It is conceptualised that empowerment of female headed households, and elevating education levels of households would go a long way towards strengthening the ability of the households to manage pastoral risks (Aboud *et al*, 1996).

2.7.2 Conceptual Path Model

Derived from the research conceptual framework discussed above, the following conceptual path model can be drawn:

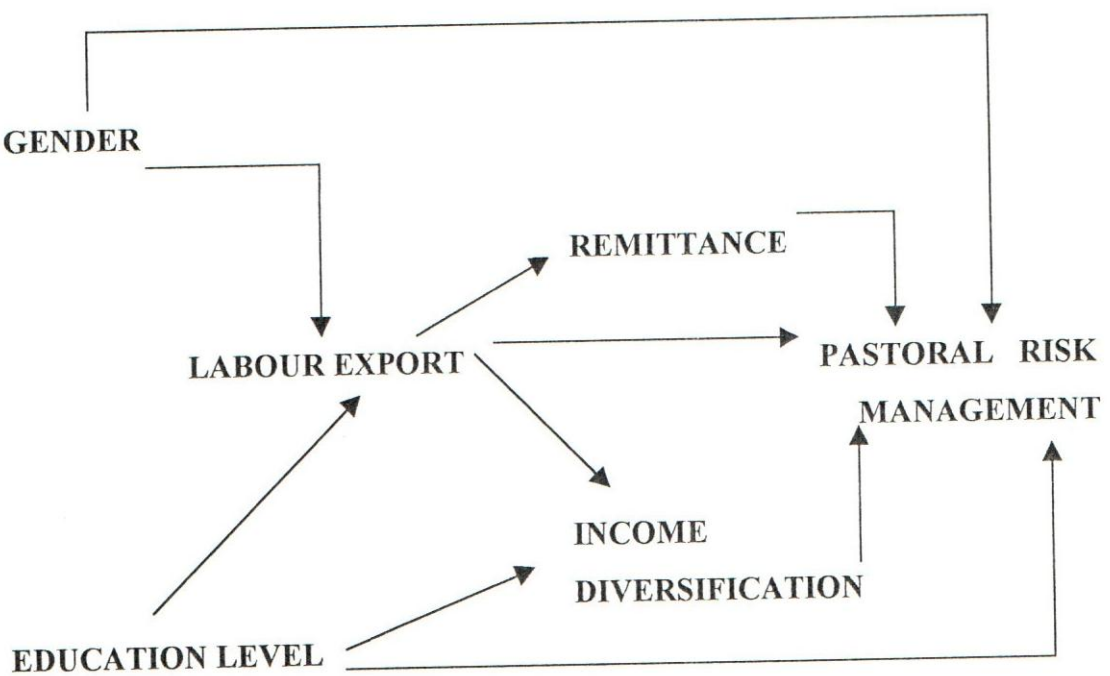


Figure 1: Conceptual Path Model

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 The Study Area

This study was conducted in Marigat division, which is located in the lower Baringo district. Marigat covers an area of 1224 sq.km and is one of the eleven divisions comprising the district. It is situated in an arid ecosystem (ecological Zone 5) and has ten locations. The altitude is 1200m above sea level with generally low and almost flat relief, dissected by several seasonal streams and one major river Perkerra, which supplies most water to Perkerra Irrigation Scheme (Baringo District Development Plan, 1999-2001).

Much of the area receives low rainfall averaging 635mm a year. There are two seasons of rainfall: the long rains start from the end of March and last to the beginning of July and short rains from the end of September to November. The area experiences frequent droughts, which affect economic activities especially livestock keeping. Temperatures are high, ranging between $30\ ^{0}$C to 35^{0}C with the hottest months being January to November. In general, the study area is hot with high diurnal temperatures.

The soils are complex and are of various textures and drainage conditions, which have developed alluvial deposits, with some saline, while large areas are characterised by shallow stony soils with rock outcrops and lava boulders (Baringo District Development Plan, 1999-2001).

Vegetation consists of mainly thorny trees with patches of grass and a few types of swamp vegetation. Most of the trees are acacia species, while other species form bushes. Some areas have long grass during the long rains while most of the areas have short grass. Loboi and Lake.Bogoria swamps form the grazing areas. During severe droughts like the one experienced at the time of research conducted between March and May 2000, there was barely any vegetative cover (fodder) for the animals.

Baringo District has a population of 379,100 (1999 census). Marigat division has a population of 54,202 persons with a density of 44 persons per square kilometre. Generally, lower Baringo has a low population, which is sparsely distributed. In Marigat town, Perkerra scheme and Lake Baringo fishing point, the population density is higher than the rest of the areas (Baringo District Development Plan, 1999-2001).

The population studied consisted of Ilchamus and Tugen communities who are mainly agropastoralists. The study did not include the Pokot found towards the margin of Marigat division because, the research fund was not available to cover expansive area. The approximate number of household heads in the discussion is 9,500. The annual growth of population was 5.4% in 1998. There is a high rate of rural-urban migration. Many household members migrate to other areas to look for employment opportunities as an alternative way of survival (Baringo District Development Plan, 1999-2001).

Resources potential include land, soils, forestry and wildlife. Major social economic activities are livestock rearing, bee-keeping, fishing in Lake Baringo, crop farming such as maize, beans millet and vegetables. There is intensive irrigation in the

Perkerra irrigation scheme, which draws most of its labour force from the surrounding pastoral communities. Livestock production is the major economic activity where cattle, goats, camels, sheep and donkeys are reared. Livestock products consist of milk, meat, hides and skin which are sold outside the study area. Few of the households are engaged in bee keeping, charcoal sales and other petty trading (Little, 1985).

The infrastructure is poorly developed. Few scattered schools with poor facilities are found in the study area. There is one major tarmac road, which transects the area; the Nakuru-Kabarnet road. Most of the District is served by seasonal roads. There are only a few water points, which dry up during the dry seasons. Few livestock dipping facilities are available, some of which are not in good working condition.

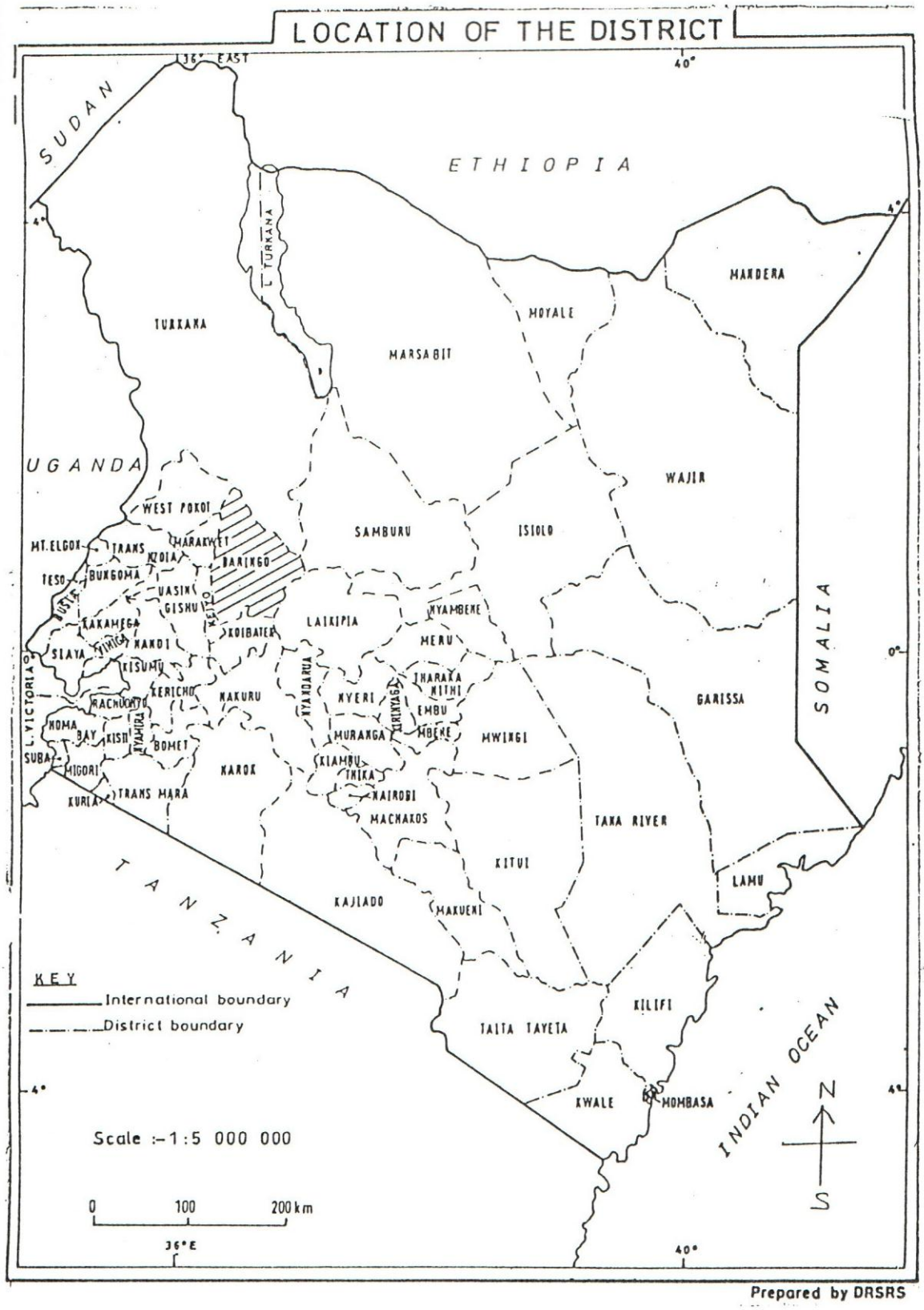


Fig 2 Map of Kenya

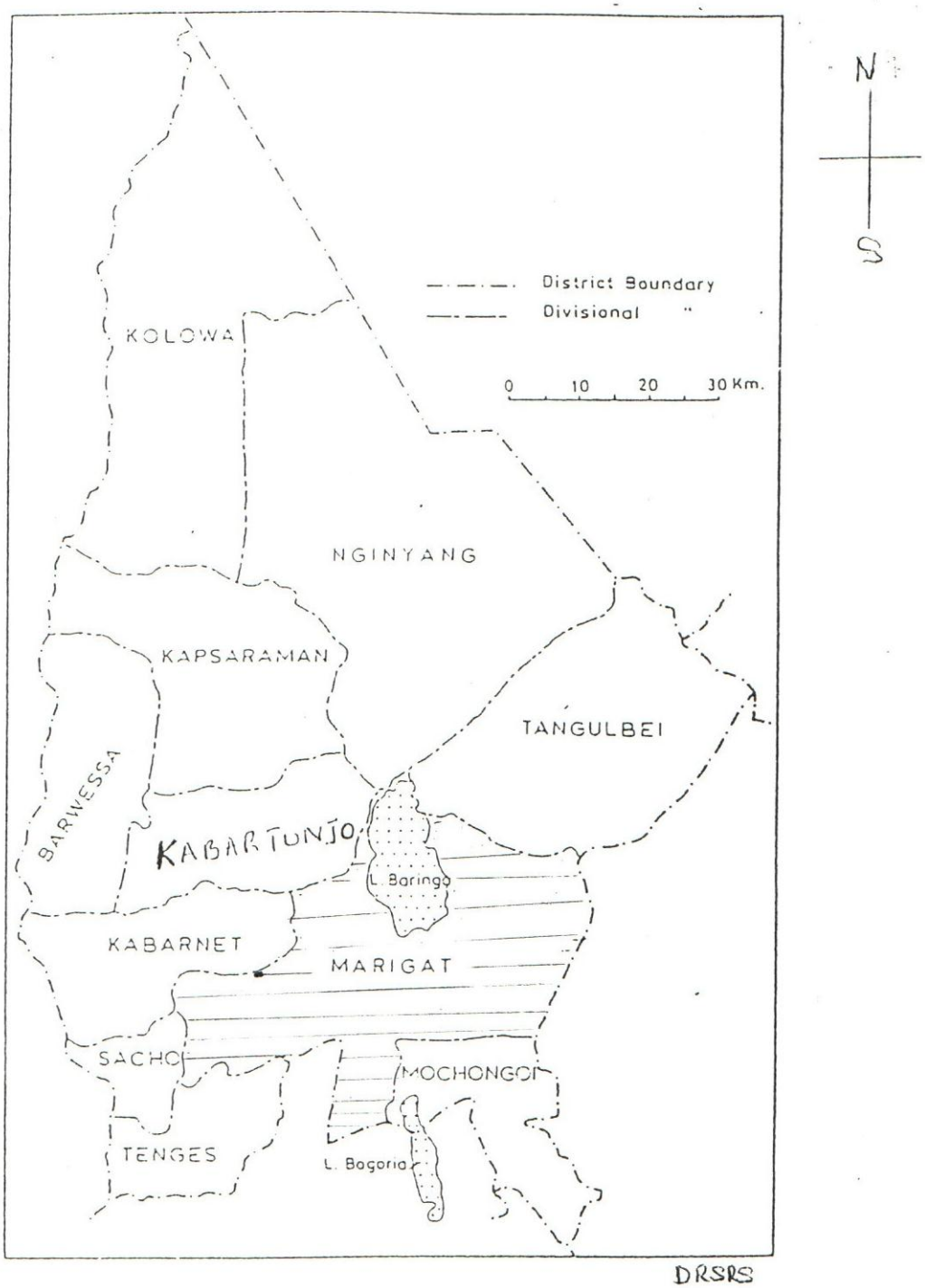
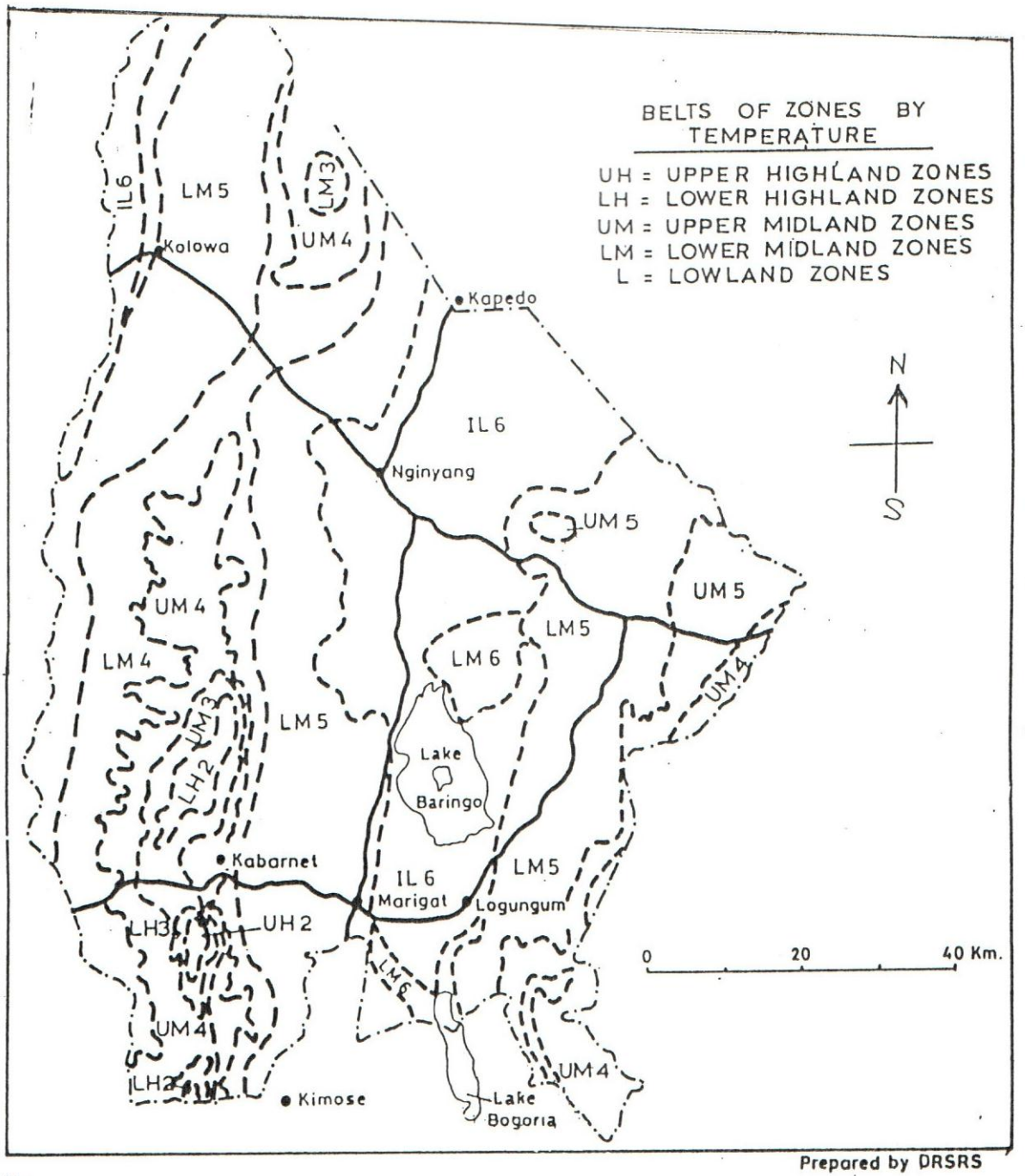


Figure 3 *The Map of Baringo District: The Administrative Boundaries.*



Key:

IL6	Ranching zone
LM6	Lower Midland ranching zone
LM5	Livestock and Millet
UM4	Sunflower and Maize
LH5	Wheat Maize and Barley
LM4	Marginal Cotton
UH5	Livestock and Sorghum
LH2	Wheat; Maize, and Pyrethrum
UH2	Pyrethrum and Wheat
UM3	Marginal Coffee

Fig 4 The Map of Baringo District; Ecological Zone.

3.2 Research Design

The design used was ex-post facto (the respondents gave their views without any influence) based on a one time cross -sectional study, with the data collected at one point in time. A Sociological Survey design with structured questionnaire was used to collect data from households.

3.3 The Population

Baringo District has eleven divisions with a population of 377,000 persons and 63,000 households. Marigat Division where the study was carried out had 9,500 households. The four locations (Marigat, Eldume, Salabani and Ngambo) where the 206 households were randomly sampled for study had 3,400 households. The 206 agropastoral households was regarded as a good representative of the communities living in Baringo District and the results of the study would be helpful in predicting and reflecting pastoral population in Kenya.

3.4 Sampling Procedures and Sample Size

Prior to the actual field study, visits to the study area were made in order to examine the study population. Four out of ten different locations, which had similar ecological conditions but varied in socioeconomic status, were randomly selected for study.

The sampling frame of the study area consisted of households in Marigat division, of which 206 household heads were randomly sampled and interviewed. The four locations picked for the study were (i) Eldume (ii) Marigat (iii) Ngambo and (iv) Salabani, Eldume, Ngambo and Salabani are occupied by Ilchamus community while Marigat location is for the Tugen community. From each location the number of household heads interviewed were as follows:

Table 5 *Distribution of Sampled Households in the Locations*

Location	Eldume	Marigat	Ngambo	Salabani
Households	40	58	64	44

Cluster-sampling method was used to pick the sampled households for the study. The reason for this is that the households are not proportional in number to the locations, and do not in any way form a pattern as found in developing countries (Casley, & Lurry, 1987). In each of the four locations, household heads (both males and females) were listed and randomly sampled proportional to the total number of households in that location.

The Ilchamus community was given three locations for the study because it formed the main basis of the research, because, they are more of agropastoralists than the Tugen.

3.5 Instrumentation

A questionnaire containing both open and closed-ended questions was administered to both male and female household heads. The questionnaire contained questions addressing the

specific objectives and hypotheses stated in the study and also biodata information including age, marital status, ethnicity, sex, occupation, household assets, and food situation. To ensure validity and reliability, the first draft of the questionnaire was pre-tested. This was done by using a number of household heads in the study area, but not those included in the sample. The findings from the pre-tested questionnaire were incorporated in the final draft that was used The questionnaire was also passed to a number of lecturers for comments and improvement. The researcher selected key informants for interview to crosscheck issues and to obtain supplementary information (see appendix - questionnaire).

3.6 Data Collection

Four enumerators, one from each location were selected on merit and trained to assist the researcher in the administration of the questionnaires, and helping in identifying and locating the sampled household heads. The enumerators were also useful in interpreting the questionnaire to illiterate household heads. This was done after the research permit had been granted from the Office of the President through the

District Commissioner, with the co-operation of the divisional office, the chiefs of the four locations and community leaders. 206 household heads responded to the questionnaire. For additional data, the researcher interviewed twenty key informants. Also secondary data, personal observations and small group discussion techniques were used to cross check and add information to the collected primary data from the questionnaire.

3.7 Data Analysis

Both descriptive and analytical procedures were undertaken in data analysis. Descriptive analysis included frequency distributions, means, proportions, and percentages of socio-economic factors affecting the households in the study area.

Chi-square was used to test the eight hypotheses stated. Chi - square was used because all the variables were in discrete form (categorical data)

In determining response, differences between categories of variables, for instance between male responses and female responses, or the Ilchamus and Tugen responses, dummy variables were used.

Computer based Statistical Package for the Social Sciences (SPSS) was employed for statistical assistance in analysing the data. The independent variables being education and gender, while labour export, remittances and income diversification were intervening variables. Pastoral risk management was the dependent variable.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

In the first part, the socio-economic status of the study area was examined using descriptive analysis. Comparison was made between Ilchamus and Tugen households to capture some similarities and differences that exist in their lifestyles as far as risk management was concerned. In the second part, analytical analysis was carried out to measure the statistical significance of variables in the conceptual model.

4.2. Characteristics of the Study Population

Age, marital status, occupation, household size and gender were considered as socio-economic characteristics affecting risk management in the study area.

4.2.1 Age of Household Head

Table 8 is a summary of age of household heads in the two communities showing age composition by sex. Age is one of the indirect factors considered in the study as affecting distribution of household labour export and the activities of household head in economic production which in turn affect risk management.

Table 6: ***Age of Household Heads by Gender and Ethnicity***

Characteristics	Ethnicity		Gender	
	Ilchamus =148	Tugen = 58	Males =132	Females =74
Age of HHh (Years)	%	%	%	%
19 –39	52	64	57	52.8
40 -60	40	34	38.7	37.8
61+	8	2	4.5	9.4
Mean	41	38	39	41
Std	14	11	12	13.75

HHh ---household head

Majority of the respondents were aged between 19 and 39 years. The rest of the household heads were above 40 years. It can be concluded that most of the household heads were young adults with young household members. This explains why there were 33 % of households with persons in labour export and 67% with no labour export. In Table 6 female household heads were older than male household heads, with mean average and standard deviation of 39, 12 and 41, 14 for male and female household heads respectively.

It is concluded that there were more female household heads older than male heads in the two communities. The age difference means that more females in the study area survive into old age than the males. Generally Tugen household heads were younger than Ilchamus household heads.

Table 7: *Age of Household Heads and Persons in Labour Export*

Age of HHh (years)	labour export %
19 –39	9.2
40 -60	84.5
61 –92	6.3

HHh = Household head

Table 7 shows that household heads between 40 and 60 years age category had more persons in labour export than any other category. The number of persons in labour export therefore depended on the age of the household head. The report indicates that young household heads and very old household heads had few labour export. The reason for this was that, old household heads had grown up children who by the age of 30 years had established their own homesteads. The absence or less labour exports by young household head category is explained by the fact that their children were too young to go for labour export unless the persons in labour export were relatives living in the household. Rigby (1969) observed similar results among the Maasai community.

4.2.2 Marital Status

Table 8*: Household Head Marital Status by ethnicity and gender*

Marital Status	Frequency distribution		Ethnicity		Gender	
			Ilchamus (N =148)	Tugen (N = 58)	Male (N =132)	female (N =74)
	F	%	%	%	%	%
Single	17	9	7	12	1	22
Married	137	67	70	59	95	18
Divorced	5	2	3	2	3	3
Separated	18	9	5	19	2	22
Widow	27	13	16	7	-	37
Widower	1	0.5	8	2	0	-

Table 8 summarises the marital status of household heads in the two communities. The results indicate that there was a high rate of separation (19%) in the Tugen households than Ilchamus households (5 %). For household heads that were single, 12% and 6.7% were Tugen and Ilchamus respectively. The number of cases of female household heads found to be single, separated and widowed were much higher than the figures for male headed households. More female heads were single, separated or widowed because of not getting married, broken marriages and death of spouse.

The marital status affects household production system. Marriages become loose or break in households where there is low income or income is unstable. In such situations, wives or husbands look for other partners with wealth for survival in hard times (Buvinic *et al* 1983). Buvinic found that marriage tends to move women out of the wage sector because, traditions in certain societies do not allow women to look for

employment away from home. More women are single, separated or divorced due to household economic instability. A weak household production system tends to move men or women out of their marriage (Buvinic, 1983). The marriage conditions affect the relationship between the two partners and hence affect the management of the household economy.

4.2.3 Household Size

Table 9: ***Household Size in the Study Area by ethnicity and gender***

Frequency			Ethnicity		Gender	
HH size	Frequency distribution		Ilchamus	Tugen	Male	Female
	N = 206		N =148	N =58	N=132	N=74
	F	%	%	%	%	%
1 to 8	159	77.2	76	81	71	89
9 to16	39	18.9	20	17	24	11
17 to24	7	3.4	4	2	5	0
25 to 33	1	0.4	1	0	1	0
Mean	6.64		6	6	7	6
Std	4.10		4	3	5	2

The distribution of household size according to ethnicity and gender is summarised in Table 9. Majority of households had less than five members, while a few households had over eleven members. Five percent of Ilchamus and 2% of Tugen had over eleven persons in the households. There was very small difference in household size between Ilchamus and Tugen households. Five percent and 0% of Ilchamus and Tugen households had over eleven persons respectively. The difference in household size between male and female-

headed households was significant with male-headed households having a higher household size than female headed households. Generally, the size of households in the study area was relatively small. Agropastoral societies traditionally have large family size due to extended families that were regarded as useful in providing labour for herding livestock. The small household size found in the study area was similar with other workers who found household size declining over the years (Jacob, 1965; Njoka, 1979). The reasons for the decline were that fewer men practise polygamy, increase in family planning methods and the problem of diminishing grazing land forcing the community to reduce the rate of childbirth. Vlakveld & Scheffer (1992) noted that the size and composition of the household was a very important strategy in pastoral production systems. A large household size provided sufficient number of people to perform different types of work in the management of household pastoral risks. The small household size and young household heads in the study area were likely to influence household labour export.

Male headed households tended to have a large household size due to polygamy and extended families compared with female-headed households. The size of the household affects the usefulness of household remittance. In a large family, the remittance a mount would not be enough to cope with the lifestyle compared with a small family receiving the same amount of remittance. It is argued that a large household size provides more persons for labour export than a small household size (Vlakveld & Scheffer, 1992).

4.2.4 Occupation of Household Head

Table 10: *Occupation of Household Heads in the Study Area by ethnicity and gender*

Occupation	Frequency distribution N =206		Ethnicity		Gender	
			Ilchamus N=148	Tugen N=58	Male N=132	Female N=74
	F	%	%	%	%	%
Permanent Employment	48	23	23	24	33	7
Contract	23	11	7	23	15	4
Self- employment	48	24	16	43	15	38
Herders	12	5	7	2	5	7
Farmer/herder	52	25	32	9	32	14
Housewife	23	11	16	0	-	31

Note: Self-employment means carrying out petty trading such as selling of crop /animal products, craft sale, honey sales, charcoal, firewood sales and Jua kali artisan

From Table 10, the highest proportion (52%) of household heads were farmer/herders confirming the fact that the two communities were agropastoralists. Self and permanent employment ranked second (48%). Comparing the two communities, Tugen household heads in self-employment and contract were more than the Ilchamus. On the contrary, a larger number of Ilchamus household heads were more involved in farming and herding of livestock than the Tugen household heads. The results in Table 10 indicate that men were more involved in salary/wage employment than women and more male heads had their income from livestock than female heads. It means that male heads kept more livestock than the female heads. This can be explained thus, traditionally most men owned

livestock while women did not own livestock but only took care of them. Education and cultural backgrounds explained differences in occupation of household heads among the two communities. Tugen heads were more educated and therefore had better competition in job opportunities than the Ilchamus household heads. Few females were in permanent employment because of the low level of education background and traditional roles of women restricting them from competing with men. A large number of women were engaged in self-employment as a way of surviving risks such as drought and famine while most men were involved in salaried employment compared to women. The pastoralists have realised that depending on livestock alone did not augur well with the harsh conditions and modern ways of survival. Better means of survival must therefore be sought. It can be concluded that the household heads participated in other income generating activities although their participation lacked a lot of support from the government policy, particularly so for the female heads.

4.2.5 Gender of Households

Gender refers to social roles played by both sexes (male and female) in the households. It was found that men and women had different roles in the households as far as household economic production is concerned and each sex had strategies of risk management. The comparative study carried out on male and female-headed households in the study area are discussed below.

4.2.5.1 Gender Influence on Labour Export

In pastoral areas, male and female roles in economic activity and subsequently on household risk management were studied regarding labour export.

Table 11: ***Household Labour Export in the two Communities by ethnicity and gender***

Labour export Number of persons in labour export #	Frequency distribution N=206		Ethnicity		Gender	
			Ilchamus N=148	Tugen N=58	Male N=132	Female N=74
	F	%	%	%	%	%
0	138	67	66	65	67	65
1	40	19	21	17	20	19
2	25	12	12	14	11	14
3	1	1	1	2	1	1
4	2	1	1	2	1	1

Out of 206 households, majority (67%) had no labour export. As the number of labour export increases the number of households decreases. Labour export was proportionally distributed in both male and female headed households.

Generally, the number of labour export was low. The reasons for this is that,(a) most of the households interviewed were young, (b) most of the household heads were illiterate hence had a low degree of motivation towards educating their children, (c) poor education facilities coupled with the high level of poverty, and (d) many household members were used for household labour to herd livestock.

Table 12*: **Labour Export by gender***

Gender	Male	Female
Labour Export	80	21

The male proportion (80%) was higher than female proportion (20%) Table12. Males in labour export had more influence on household risk management because, they were more than the females. It can be concluded that gender of persons in labour export influence risk management while gender of household heads had no impact on risk management.

4.2 5.2 Gender and remittances

Table 13*: **Household Remittances by gender***

Remittances	Male (%)	Female (%)
None	68	68
Yes	32	32

(X^2 = 1.734, df =1, p> 0.05 (.153)

The results in Table 13 indicate that there was no statistical significant difference between male and female headed households as remittance received was concerned at p >0.05. Both male and female-headed households received slightly similar amounts of remittances in a year. Table 14 shows that the average mean amount of remittance received by female-headed households was slightly higher than male headed households.

Table 14: ***Households Remittances by Gender and Ethnicity***

Remittances Ksh.	Frequency distribution N =206		Ethnicity		Gender	
			Ilchamus	Tugen	Male	Female
			N =148	N =58	N =132	N =74
	F	%	%	%	%	%
0	140	68	67.6	69	68.2	67.6
<5000	47	22.8	23.6	20.7	23.5	21.6
5000-10000	10	4.9	4.7	5.2	5.3	4.0
10001-15000	9	4.3	4.0	5.1	3.0	6.8
Mean (Ksh.)	8298		8330	8212	7240	10148
Range	25000		25000	25000	25000	24900
Std	5977		6003	6079	5442	6523

Table 14 gives a summary of households receiving remittance as influenced by gender of household head. A high number of households did not receive any remittance from labour export. 91 percent of households either received low remittance of less than Ksh. 5000 in a year, while some households never received any remittance at all. A small proportion of households received high remittance, while the majority received low remittance. There was no significant difference between Ilchamus and Tugen households in terms of remittance received in a year. Female heads (7%) received high remittance compared to male heads (3%) in the same category. The mean average of remittance received in a year by female heads indicates a slightly higher amount than that received by male heads. The gender of the household

head had some influence on the persons in labour export remitting money into the households. The majority of household heads reported that the general attitude of those in labour export was that, more money was sent to the mothers than the fathers. The reason for this was that women tend to contribute a higher proportion of their remittance income to family subsistence holding back less for personal consumption compared with men. Remittance received in female headed households were used well because the females were the sole decision-makers on the use of remittance, while in male headed households, men tended to use remittance without consultation with their wives, therefore, the remittance was not well used. Sivard (1985) in her findings supports this.

Table 15: ***Amount of remittance by gender***

Characteristic	Frequency Distribution		Gender	
			Male N =43	Female N =24
	F	%	%	%
Remittances				
0	7	6.9	6.9	0
<5000	55	54.4	38.6	66.9
5000-10000	22	21.7	25.4	28.8
11000-150000	9	8.9	23	4.3
16000-20000	2	2	2	1
>21000	8	7.1	2.1	0

Table 15 summarises the categories of remittance sent into the households as influenced by gender of persons in labour export. 76 percent of persons in labour export sent remittance amounting to less than ten thousand Kenya shillings and only 18% sent over ten thousand shillings. It was noted that most of the persons sending remittance back home were low remitters (The classification of the remittance sent home was based on the lifestyle of the study area and the average amount regarded by the respondents as good enough to meet household needs). 95 percent and 74% females and males in the labour export sent remittance of less than Kshs. 10,000 respectively, while, 5% and 27% females and males in the labour export sent remittance above Kshs. 10,000 respectively. Males in the labour export sent more money than females in labour export. Therefore the gender of persons in labour export influences remittance to the households.

Since most of the remittances sent into the households were very negligible and only a few households received remittance, the impact of remittance on the improvement of welfare of the household members was very small. For the households receiving remittance, the impact was greater than households receiving no remittance.

Household remittances are used to improve the livelihood of households. Studies by Galani, *et al* (1981) found that remittances have been used by families to expand on existing businesses or to start new ones. The only problem of its effectiveness were the extended families, which tended to consume more and leave less for investment for sustainability as reported by the respondents.

Sofranko and Idris (1999) explained that, households receiving remittance are better off than those households not receiving remittance, but the importance of remittance depends on the size of the household and the amount sent. They noted that although there was a little difference between households receiving remittance and those not receiving, the difference was not significant.

For additional information, gender of persons in labour export was found to influence remittance. The amount remitted by males in labour export was more than that of females. This is because males were more in labour export than females (Table 12). On the other hand, of the amount remitted, the mean average sent to the households show that females remit higher amounts of money than the males (Table 14). If females were given equal opportunities, they would send more money and do better than the males.

4.2. 6 Gender and Income Diversification

Table 16*: Number of Income Sources by Gender and Ethnicity.*

Number of Income Sources	Frequency Distribution N =206 F	%	Ethnicity Ilchamus N =148 %	Tugen N =58 %	Gender Male N =132 %	Female N =74 %
0 –3	74	36	35	38	25	58
4 –7	114	55	58	48	68	32
>7	18	9	7	14	8	10
Mean	5		5	4	5	4
Std	2		9	9	9	9

From Table 16, generally most of the household heads had income sources ranging between 4 –7. Sixty five percent and 62% Ilchamus and Tugen household heads had less than 7 income sources respectively. Seven percent and 14% Ilchamus and Tugen had more than 7 income sources respectively. It can be concluded that Tugen household heads had more income sources than Ilchamus. There was a big difference in the number of income sources in category 4 -7 between male heads (68%) and female heads (32%). It can be concluded that there was gender difference in household income sources. Male household heads had more income sources than female household heads.

Table 17*: Gender of Household Head on Household Income Diversification*

Income Diversification (# of income sources)	N= 132 Male Headed (%)	N = 74 Female Headed (%)
0 -3	24	58
4 -6	68	32
7 -10	8	10

X^2 =26.843, df = 2 significant at p< 0.05

The results in Table 17 are a summary of the influence of gender of household head on household income diversification. There was statistically significant difference between male and female headed households on household income diversification. The percentage proportions indicate that male-headed households (68%) had slightly more income sources than female headed households (32%). As the number of income sources increase, the number of female headed households decrease while in male headed households there was increase followed by decrease. Gender of household head therefore influences income diversification at household level.

4.2.7 Education

Table 18*: Education Level of Household Heads by Ethnicity and Gender.*

Education level	Frequency Distribution N =206		Ethnicity Ilchamus(148)	Tugen(58)	Gender Male (132)	Female(74)
	F	%	%	%	%	%
Illiterate	75	36	42	22	23	61
Primary 1-4	16	8	9	3	9	5
Primary 5-8	63	31	26	41	36	22
Secondary	28	14	11	21	15	11
Post secondary	24	12	12	12	17	1
Mean level	2.6		2.4	3	2.95	1.86
Range	4		4	4	4	4
Std	1.4		1.41	1.28	1.36	1.17

Key: - Illiterate) = those who have not gone to any formal school

Table 18 gives a summary of levels of education attained by the household heads in the two communities as influenced by gender. The report shows that in general, the level of education was very low in the study area. Majority of household heads never went beyond lower primary level (primary 4). The level of education was lower in Ilchamus than in Tugen household heads. 42 percent and 22% Ilchamus and Tugen respectively were illiterate. From the results, it can be concluded that the Tugen household heads were more educated than the Ilchamus household heads. The reason for this is that the majority of Ilchamus households were still keeping to their traditions of pastoralism. Lack of proper education programmes and facilities exacerbated

the problem. Examination of the level of education for male and female household heads indicates a significant difference. 32 percent and 12% of male and female heads attained secondary and post secondary level of education respectively. Male household heads were more educated than the female heads. Generally, most of the areas had less educational facilities and there was lack of access to education and information dissemination. The Tugen households were more exposed to the changing lifestyles and better economic opportunities than Ilchamus households.

4.2.7.1 Education Level of Persons in Labour Export. It was worth examining the education level of persons in labour export. It was found that the level of education significantly influenced persons in labour export. The respondents (household heads) were asked to state education level of each member of the household. Table 19 reports the results.

Table 19: ***Educational Level by gender for Persons in Labour Export***

Education level	Gender	
	Male = 80	Female = 21
	# (%)	# (%)
Illiterate	7 (9)	2 (10)
Primary 1 –4	3 (4)	3 (14)
Primary 5 –8	26 (32)	4 (19)
Secondary	35 (44)	11 (52)
Post secondary	9 (11)	1 (5)

Most of the persons in labour export attained secondary level of education, fewer numbers were illiterate and few acquired post-secondary level of education. Level of education therefore influenced labour export. Although there were fewer females in labour export than males, there was no significant difference as far as level of education was concerned. Education was found to favour males more than females. Traditionally, female education was affected by girls either being married early before completing their school or by being busy with household chores such as fetching of firewood and collecting water, preventing them from attending school. Low labour export could also be attributed to herding of livestock where young boys and girls were used in the household to perform pastoral activities such as herding animals, fetching water and firewood. Greenhalgh (1985) found that the reason for gender difference in education was due to the following reasons: (a) parents do not have the same preferences for their sons' and daughters' education. Parents tend to favour sons more than daughters in pastoral societies, (b) where labour market rewards education for males more than females, parents respond by giving females less

education (c) both parents' education had strong positive effects on education of the children, especially the females and (d) the strong cultural practices are believed to be the drawbacks in education of the pastoralists. Studies have shown that many pastoral societies do not take their children to school because the children provide labour for herding livestock. The most affected group were the young girls who were married off at an early age. They also believe that educating girls leads to women becoming independent of men and more often than not they are married to other communities. It can be concluded that education affects household labour export.

4.2. 8 Household Remittances

Remittances are in form of money or any other goods sent to the households with the aim of improving the living standards of household members by the persons temporarily working and staying away from home. In the study area it was found that there were few households receiving remittances.

4.2.8.1 Remittance and Risk management

Table 20: ***Remittance category by Risk Management category***

Risk Management Category	Remittance Category				
	0	1	2	3	Total
1	84	29	6	6	125
2	56	18	4	3	81
Total	140	47	10	9	206

(X^2 = .185 , df = 3, p = 0.980)

The report indicates that there was no statistical significant relationship between household remittance and household risk management (Table 20). Majority of household heads either did not receive any remittance or they received low remittance. The effect of the remittance received was not significant.

4.2.9 Income Diversification

For the survival of the family, household heads were reported to engage in various income generating activities. Some households were found to be more diversified in income generating activities while others were less diversified. The responses by the household heads towards managing household risks in terms of income generating activities are summarised in Table 21.

Table 21: *Respondent's Income Sources by ethnicity and* ***gender***

Sources of Income	Frequency Distribution (N = 206)		Ethnicity # Ilchamus(148) Tugen(58)		Gender # Male (132) Female (74)	
Type	F	%	%	%	%	%
Salary/wage	97	47	45	53	56	31
Small stock	132	64	72	45	73	49
Large stock	96	47	56	22	55	32
Charcoal/ Firewood	17	8	5	16	5	15
Craft sale	9	4	3	7	2	9.5
Petty trade	61	30	20	53	27	33
Crop sale	91	44	40	55	43	46
Honey sale	7	3	1	9	4	3
Transport	9	4	1	14	3	7
Rental houses	13	6	3	16	6	7

Note: The percentages in the table are greater than 100 because of the multiple responses. Example, one household head may have more than one source of income.

Data from Table 21 indicate ten important income generating activities at the household level in the study area. Livestock keeping ranked as the most important economic activity followed by growing of crops and crop sales. Petty trading was noted as the third most important income generating activity.

Comparison of income sources between two communities revealed that livestock keeping stands as the main household income generating activity among the Ilchamus, while among Tugen fewer household heads kept livestock. Petty trading, crop sales and small stock were the main income generating activities for both communities but were more practised by the Tugen households than the Ilchamus households. In both communities honey sales, craft sales and motor transport had low household participation.

Male-headed households were more involved in livestock sales and permanent/contract employment, while the female headed households were more involved in crop sales, petty trades, craft sales, and Charcoal/firewood sales. The differences noted between the two communities were due to differences in the level of education and subsequently, traditional gender roles. It is worth noting that the two communities share the same ecological conditions and hence have similar economic activities. Any risk experienced affected both of them. The management of risks in this area therefore depends upon the households. This insight was gained from key informants

during the discussion session. Although, the above economic activities operate in the two communities, there were a number of problems that hinder their development.

4.3 Risks Faced by Respondents

Harsh ecological conditions faced by the respondents have been summarised in Table 22 indicating respondents' views on the risks faced by them.

Table 22: *Risk problems faced by respondents*

Problems faced by Household heads	Responses (yes) N = 206
Drought problem	# (%)
• Drought is a problem	196 95
• Severity of the drought	
-- Very severe	159 77
- severe	31 15
- Not severe	8 4
• Fodder availability during drought	16 8
• Water availability during drought	62 30
Diseases of livestock	
• Diseases a problem	186 9
Severity of the disease s	
- Very severe	82 40
- severe	28 14
-not severe	9 4

N/B –The percentages were greater than 100 because of multiple responses.

Some of the economic activities of the household heads and the risks affecting them are highlighted below:

Table 22 shows that very severe drought occurrence and livestock diseases were among the serious problems faced by the respondents. This has made livestock keeping a serious and risky business.

This research was conducted between February and May 2000, a time when the worst drought occurred in the area and its effect on the lives of the respondents was observed. A large number of livestock died due to lack of water and fodder. The respondents ranked drought as the number one problem facing livestock production. Livestock diseases came second. Raiding /insecurity were less common in the area. Livestock marketing was observed as a risk factor affecting the livestock production but the discussion is beyond the scope of this study.

Range areas are not suitable for arable farming though people find this to be a means of improving household income. Marigat division where the study was carried out was an exception. The crops grown were mainly maize, sorghum, millet, beans, and vegetables. There was inadequate rain. The drought problem and unavailability of enough water was a hindrance to this type of economic activity. Of the households interviewed 140 (68%) own farms of which 91(44.2%) grow crops for sale and subsistence. Most of the crops are grown through irrigation. The results indicate that besides livestock keeping, many household heads were engaged in subsistence crop farming. Most household heads practised both livestock and crop farming (agropastoralism).

Trading on other commodities and farm products like milk, hides / skins, chicken, eggs, fruits and vegetables were done mainly by female household heads and a few male heads. Other businesses such as small kiosks, handicrafts, tailoring, hotel keeping were also

practised mainly by female heads. The problem of petty trading was lack of credit facilities to support the businesses. Women were most adversely affected.

Although a few households were involved in charcoal/firewood trade, the charcoal/firewood business faced many problems such as scarcity of trees, which hinder the quantity burnt for sale, and environmental regulations, which forbid felling of trees.

From the interviews, information from Key informants and discussion groups, only 7 (3.4%) of households were involved in bee keeping. The rest, 199 (96.6%) did not practise the business. Due to overgrazing and increased deforestation and bush clearing for cultivation and settlement, bee colonies and bee keeping had declined. Other constraints to bee keeping are poor markets, storage facilities and lack of extension services. These results are corroborate research conducted in Ukambani rangeland (Farah *et al,* 1996).

The proportion of participation by gender and ethnicity in employment is given in Table 10. The problem of unemployment is high because for skilled labour market one must have higher level of education. Since more men than women have better education, more male household heads were employed than women. Most working women were in self-employment because, they had low level of education, and thus, could not, compete favourably with their male counterparts in wage /salary employment. The proportion of women in self-employment were larger than those of men (Barbara & Shahidur, 1991). The results show there were more women housewives in Ilchamus than in Tugen communities as observed in the study (Table 10).

4.3 Management of Risks

Risk and uncertainty in pastoral systems arise from many factors such as drought, famine and livestock diseases, market fluctuations, insecurity, raiding and theft (Coppock, 1994). However, drought is the most prevalent and least manageable source of risk for livestock loss in Marigat division of Baringo district. Pastoralists, therefore stand a big chance of losing a large proportion of their livestock assets. Species diversification, herd segregation, and herd dispersal over a wide range of grazing lands and social networks were the most commonly used mechanisms to spread and mitigate risks in pastoral systems (Jahnke, 1982; Galaty & Johnson, 1990).

Respondents were asked to state how they manage risks affecting their household economic activities. The responses are summarised in Table 25. Some of the methods used in mitigating risks such as drought mentioned by the respondents were; (1) migration from the area to where there was fodder and water for the livestock; (2) destocking; (3) buying and storing fodder; (4) lending out livestock; (5) selling of livestock during drought to reduce the number for easy management. Both communities used all the above methods.

The level of food insecurity in the area was reported as very high. Majority of households received food in form of relief aid and food for work programme. These donations came from the government and other organisations. Few households sold their livestock to obtain money to buy food, while, salary/wage was used to alleviate poverty. Ilchamus had larger number of households receiving relief food aid. Female headed households received more relief food aid than the male headed households.

Livestock diseases were also common in the area. Alarge number of households still use ethnoveterinary services for controlling and treating their livestock. Respondents reported that conventional veterinary services were too expensive and were not easily available for use when needed. This trend was a general observation in the two communities and also in male and female headed households. It is evident that from the findings the effectiveness of the traditional organisations and institutions to manage the pastoral system, however, is weakening as resources are depleted and competition among households intensifies. The pastoral system is becoming unstable and less reliable to support pastoral families. This is due to overpopulation, loss of grazing lands to cultivation and settlement. The main constraints that the agropastoralists in Baringo encounter in their attempts to engage in non-pastoral economic activities are: lack of good education opportunities; poor information dissemination; and gender imbalance in household economic production.

Table 23*: Management of Types of risks by Ethnicity and Gender*

Management of Risks	Frequency Distribution		Ethnic		Gender	
			Ilchamus	Tugen	Male	Female
			N =132	N =74	N=!32	N =74
	F	%	%	%	%	%
Drought						
Migration	87	42	47	31	45	38
Buy/store fodder	61	30	25	41	30	28
Destocking	24	12	15	3	16	4
Lend out animals	1	1	1	0	1	0
Famine						
-Relief food	87	42	48	28	37	51
-Buy food from salary/wage	99	48	47	52	53	39
-Income from business	31	15	18	9	16	14
-Remittance	4	2	2	2	2	3
-Sell livestock	67	33	45	2	39	20
-Borrow food	44	21	25	12	17	28
Livestock disease Treatment &Prevention						
-ethnoveterinary	145	70	70	71	76	61
-Use vet services	24	12	14	7	15	5
-Destocking	2	1	1	0	1	1
-Combine all above	2	1	1	0	1	1
Livestock Condition (bad)	56	28	28	28	24	23
Fodder availability (bad)	16	8	5	16	9	5

4.4 Gender and Education as they Influence Risk Management

The following relationships are based on the eight hypotheses in the study, which have been statistically tested to determine the influence of gender and education on risk management through labour export, remittance and income diversification. Various analytical tools were used to test the hypotheses and objectives of the research study.

Gender role in household risk management has been examined with regard to pastoral communities in lower Baringo District. Male and female-headed households were compared with reference to the two communities. The study examined how gender influences household pastoral risk management through labour export, remittance and income diversification.

4.4.1 Gender Influence on Pastoral Risk Management

Hypothesis 1 There is a relationship between gender and pastoral risk management.

That males are able to manage risks better than females.

Table 24*: Degree of risk management by Gender*

Pastoral risk	Male N = 132	Female N =74
Low risk Management	67 (51%).	58 (78%)
High risk Management	65 (49.%)	16 (22.%)

X^2=15.162, df =1 , p< 0.05 (0.000)

Female heads were found to have significant difference between low and high-risk management. Female heads were in low risk management category than high-risk category. This shows that female heads were more affected by risk management than male heads. Gender of household head, therefore, influences risk management. Gender of the household was statistically significant to risk management (Table 24).

4.4 2 Education and Risk Management

In traditional pastoral system economy, indigenous education played a prime role in the sustainability of life. With the emergence of market economy, this type of knowledge is no longer sustainable. It is believed, formal education orientates one into a more sustainable market economy as it does with non-pastoral societies (Were, 1985) With this in mind formal education and its influence has been examined on household pastoral risk management in the two pastoral communities.

The main hypothesis is that education influences household pastoral risk management.

Table 25 shows the influence of education level of household head with persons in labour export. 28 percent and 11% male and female household heads attained above primary 8 of school had labour export respectively. 28 percent and 54% male and female illiterate heads had labour export respectively. It can be concluded that educated male household heads had more labour export than female heads. More female illiterate heads had labour export than male illiterate heads. The education level of household head does not influence labour export.

Hypothesis 2 There is a relationship between education and pastoral risk management

That the more educated pastoralists are able to manage risks better than those with less or not educated.

Table 25*: Comparison of Household Education by Degree of Risk Management.*

Household Education Level	Low Risk Management #	High Risk Management #	Total #
Illiterate	49	26	75
Primary 1-4	9	7	16
Primary 5-8	35	28	63
Secondary	18	10	28
Post secondary	14	10	24
	125	81	206

$X^2 = 1.853$, df = 4, p =..396 at p>0.05)

The results in Table 25 indicate that there was no statistically significant relationship at P > 0.05 between household education levels and pastoral risk management. Whether the household head was illiterate or educated, there was no difference in the management of household risks. Education level of the household head in the study area does not influence the management of household risks. The formal education offered to the pastoralists may not be practical in addressing their problems.

4.4.3 Influence of Labour Export on Risk Management

Hypothesis 3 There is a relationship between labour export and pastoral risk management.

That households with more people working and temporarily settled away from the households tend to manage risks better than those households with less or no people working and temporarily settled away from the households.

Table 26: ***Risk Management by Labour Export***

Risk management	Labour export			Total
	0	1	2	
Low risk mgt	85	39	1	125
High risk mgt	53	26	2	81
Total	138	65	3	206

X^2 =1.00 , df =2, p =0.606)

In Table 26, results show that the relationship between labour export and risk management was not statistically significant, although there was positive influence on risk management in households with labour export. Households with more persons in labour export was found to manage risks better than households with less or no persons in labour export. These results indicate that the total amount remitted to the households depend on the number of persons in labour export and the household risk management will also depend on the amount of remittances received into the households.

Table 27: *Remittances by Gender*

Remittances Received (Response)	Male Households (%)	Female Households (%)
None	68	68
Yes	32	32

$X^2 = 1.734$, df =1, p> 0.05 (.153)

The results in Table 27 indicate that there was no statistically significant difference between male and female headed households as far as remittance received was concerned at p >0.05. Both male and female-headed households received slightly similar amounts of remittances in a year. In Table 14 (page45) it was found that the average mean amount of remittance received by female-headed households was slightly higher than male headed households.

4.4.4 Indirect Effect of Gender on Risk Management through Labour Export

Hypothesis 4: There is a relationship between gender and pastoral risk management, through the influences of labour export

That households that send more males as labour export, tend to manage risks better than households that send more females as labour export.

Table 28*: Labour Export by Gender.*

Labour Export	Male Households (%)	Female Households (%)
None	67	66
Yes	33	34

X^2 =0.939, df = 1, significant at p>0.05 (.345)

There was no statistically significant difference between gender of household head and household labour export.

4.4.5 Indirect Influence of Education level Through Labour Export.

Hypothesis 5: There is a relationship between education and pastoral risk management, through the influences of labour export

That more educated households will tend to send more members as labour export, and will thus manage risks better than the less educated households.

Table 29: *Education levels by numbers in Labour Export.*

Education Level	Labour Export
Illiterate	4
Primary	12
Secondary	75
Post secondary	10
Total	101

Table 29 shows that the higher the education level of persons in labour export, the more the household labour export. This applied only up to secondary level. Beyond secondary level there was a reduction of the persons in labour export at post secondary level meaning that in the study area, few household members reach post secondary level. This also explains that the fewer number of persons in labour export found in the area has little impact on household risk management.

Table 30: ***Influence of Education Level of Household Head by households in Labour Export.***

Household head Education Level	Households with Labour Export N =68	
	F	%
Illiterate	26	38.2
Primary 1-4	14	12
Primary 5-8	19	28.9
Secondary	7	10.1
Post sec	8	11.8

Table 30 indicates no relationship between education of household heads and labour export. It can be concluded that education of household head does not influence household members migrating to other areas outside the household temporarily in search of employment.

Generally, the total household education and education level of persons in labour export was found to influence labour export, but labour export had no influence on household risk management. The reason for this is that only 68 out of 206 households had

persons in labour export. The ratio of households with labour export was too small, hence did not effect any impact on management of risks in the study area.

4.4. 6 Education and Income Diversification

Hypothesis 6: There is a relationship between education and pastoral risk management, through the influences of income diversification.

That the households that have better educated household members tend to diversify their sources of income than those households with less or no household members educated.

Table 31*: Household Education Level by Income Diversification*

Education Level	Income Diversification #			
	1	2	3	Total
Illiterate	44	54	4	102
Primary	26	47	10	83
Secondary/Post secondary	4	13	4	21
Total	74	114	18	206

$X^2 = 10.229$, df =4, $p < 0.05$ (0.037)

Table 31 indicates that there is statistical significant difference in the relationship between income diversification and education level of households. That the more educated the households, the more the income sources.

Educated household heads had more income generating opportunities such as permanent employment, contracts and self-employment, besides herding livestock and growing crops than less educated household heads.

Table 32: Number of Income Sources by degree of Household Risk Management

	Low Risk Management	High Risk Management
Income Sources		
0 –3	65 (32 %)	9 (4%)
4 –7	56 (27%)	58 (28%)
7 –10	4 (2%)	14 (7%)
Total	125	81

($X^2 = 40.415$, df =2, $p < 0.05$)

The results from Table 32 indicate that there was statistical significant difference between income sources and household risk management. That between category 7 and 10 there were more households (7 %) at high-risk management level than 2 % households at low risk management. The more the household sources of income, the better the risk management. High level of household education results in to more diversified household income. It can be concluded that education level influences household risk management through income diversification.

4.4.7 Indirect Influence of Labour Export through Remittances

Hypothesis 7: There is a relationship between labour export and pastoral risk management, through the influences of remittances.

That households that send more members as labour export will tend to receive more remittances and will tend to manage risks better than households that send less or no members as labour export.

Table 33: Category of Remittance by category of Risk Management

Risk Management Category	Remittance Category				
	None	Low		High	
	0	1	2	3	Total
1 (Low risk)	84	29	6	6	125
2 (high risk)	56	18	4	3	81
Total	140	47	10	9	206

$X^2 = .185$, $df = 3$, $p > 0.05$ (0.980)

The report indicates that there was no statistical significant relationship between household remittance and household risk management (Table 33). Majority of household heads either did not receive any remittance or they received low remittance. The effect of the remittance received was very small. The reason for this is that few households had labour export and the majority of households had no labour export.

4.4.8 Indirect Effect of Labour Export through Income Diversification

Hypothesis 8: There is a relationship between labour export and pastoral risk management, through the influences of income diversification.

That households that send more members as labour export will also tend to diversify their incomes, and so manage risks better than households that send less or no members as labour export.

Table 26 reported that there was no statistical significant relationship between labour export and risk management. This was because majority of households had no persons in labour export. Comparing households with labour export and those with less or no labour export, households with more persons in labour export tend to diversify their income sources. The more the household is diversified in its income sources the better the risk management (Table 34). Labour export therefore has indirect relationship to risk management through income diversification.

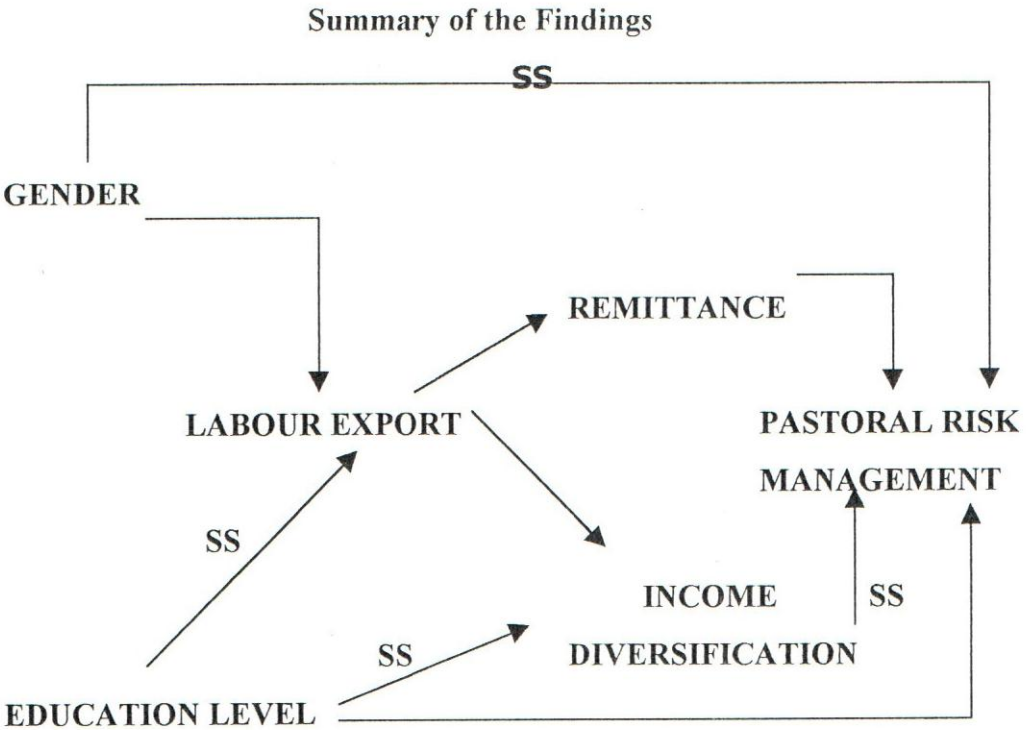
Table 34*Number of income Diversification by degree of Risk Management.*

Income Diversification	Low Risk Management	High Risk Management	Total
0 –3	65 (32 %)	9 (4.%)	74
4 -6	56 (27 %)	58 (28.%)	114
7 – 10	4 (2 %)	14 (7%)	18
	125	81	206

X^2 =40.415, df = 2, significant at p< 0.05 (.023)

Households with 3 or less sources of income were at lower level of risk management than households with more income sources which are 7 or more. Most of the households were at a low risk management level. Income diversification, therefore, influences risk management. The results in Table 34 indicate that there was statistically significant influence of income diversification on pastoral household risk management at $p < 0.05$. The more the household sources of income, the higher the level of household pastoral risk management. Households with more sources of income managed risk better than households with less sources of income. Households with persons in labour export tend to diversify their income sources and hence manage risks better than households with no persons in labour export.

4. 5 General Findings and Discussions



Key: SS ---- Arrows showing relationships of variables that were found to be statistically significant.

Fig.5 Households Results (Statistically significant)

Figure 6 is a summary of the findings. Gender of household heads directly influence household risk management significantly. Males in the households manage risks better than females in the households. Labour export does not statistically influence risk management. Education level of household head does not directly influence risk management, but does it through income diversification.

Gender of persons in labour export influence risk management. Males were more in labour export than females. Education level of persons in labour export influence labour export. The higher the education level of the household members, the

more the labour export. The more the labour export the more the income diversification. The more the income diversification the better the risk management.

This study attempted to determine the influence of gender and education on household pastoral risk management. Previous studies have shown that education enlightens one and provides a means of survival (Were, 1985). Gender balance in education and equity in household production help to increase economic diversification resulting to better risk management in the household.

The results in this study indicate that there was a difference in gender influence on income diversification and risk management while there was no statistically significant influence in gender difference on labour export and remittance. Analysis of gender on labour export showed no statistical significant influence. The number of labour export in male and female-headed households was equally similar in all categories.

In this study, remittance was found to be not statistically significant to risk management. It was postulated in the study that female households received more remittance than the male household heads but the results have shown that there was no significant difference in male and female household heads in terms of amount of remittance received. From the descriptive analysis (Table 12). It was shown that the mean remittance received by female households was slightly higher than the male headed households. Other studies by Sivard (1985) show that female-headed households receive more remittance because women manage remittance well and every remittance is used in the household unlike the male headed households. Those who are

in labour export prefer sending money home to the mothers. Even in households where both wife and husband are, the migrants still send most of their monies to their mothers.

In this study, it was assumed that male household heads were more advantaged and therefore had more income sources than female heads. The results confirmed that there was a statistically significant difference. Male-headed households were found to have more income sources than female heads of households. Male heads managed risks better than female heads of households. The reasons for these were, (a) lack of credit facilities for women, therefore, they had no access to loans from banks while men had all the advantages in this area. (b) the tradition of restricting women from working a way from home or taking up jobs which would make them compete with men in economic development hampered their progress in economic production.

In pastoral areas, there has been a big gender disparity and women have been in the background and reduced to household non- economic production partners. Women do a lot of work, which goes unnoticed. From the study, there was not much difference between female and male headed households in economic performance at the household level. Male-headed households participated more in income generating activities than female headed households. This explains why male heads were managing risks better. It can also be argued that women given all the support could manage risks equally or better than men. The reason for this argument is that, women are involved more in sustainable income generating activities, while men were more involved with

livestock production. Women, therefore, need more support to achieve better household economic production.

The level of education influence risk management through labour export, remittance and income diversification. Household education level as postulated influenced labour export. The results indicate that there was no statistically significant difference in education level of the household head and labour export. Whether the head was educated or not educated, and whichever level, there was no effect on labour export. The results were contrary to what other researchers have found. Education of parents was found to have a strong positive effect on education of their children hence enhancing the child participation in labour export (Barbara, & Shahidur, 1991). Since most of the household heads were illiterate, there was little influence on the household members, hence the results. Another reason is that family heads use household members for livestock herding. This is a more important employment than labour export. Herding of livestock by young boys and girls have hindered their education and reduced the rate of labour export in the household. In most pastoral societies, young members of the households are a source of family labour (Jacob, 1965; Njoka, 1979).

In this study, the education level of household heads had no influence on remittance received into the household. Most of the households did not receive any remittance at all whether they were illiterate or educated heads. Further analysis indicated that education level had a strong influence on persons in labour export in terms of remittance sent to the households. Persons in labour export with higher education level sent more money than those with less education level.

In this study, it was postulated that education level of household head influenced income diversification. The results have shown that there was a significant difference between education level of household head and income diversification. Household heads with better education were found to have more income sources than illiterate heads. An educated head would secure good employment (salary/wage), besides keeping livestock, growing crops and running business while a less educated head has little opportunities for venturing into more competitive economic activities.

The study shown that, there was no statistically significant relationship between level of education and household pastoral risk management. Whether a household head had a higher level of education or not, there was no difference in the way both of them managed risks. It was postulated that, the higher the level of education, the higher the level of household risk management. In non-pastoral areas, education level plays an important role in household economic management by giving one opportunity and skills to participate in self and other salary/wage employment (Were, 1985). The results obtained from the study therefore contradict what others found. This is because education received by the pastoralists is not practical to meet their needs. The key informants indicated that education curricular should aim at addressing pastoral practical values and in addition, incorporate indigenous knowledge. Education level was found to be too low among the household heads, hence it had little impact on household risk management. Most of the educated pastoralists were found to invest more in livestock, which was a risky investment because of the frequent droughts.

Studies carried out in other parts of the world indicate a positive influence of labour export and remittances sent to migrants families. This acted to create strong family ties. The income to improve living standards and even to invest in family business (Sofranko & Idris, 1999). The only problem with remittance and its effectiveness was the extended families. (Gilani *et a l* (1981) found that remittance was used to meet basic needs of the extended family members. Large and extended families were the characteristics in the study area, especially the Ilchamus households. Remittances sent into the households were used to pay for basic needs such as school fees, food, clothing, cultivation and running petty trading. This, helped in reducing household risks. Some of the household heads turn remittance into livestock investment to increase their herds for bad years. The problem was that remittance received by household heads was not high due to low labour export and low education level experienced by household heads and persons in labour exports. This resulted in having majority of household heads in the low risk management category.

It was expected in the model that gender balance in education, labour export, remittance and income diversification were factors considered to influence household risk management. From the results, income diversification came out as one of the most significant variable in explaining changes in risk management. Other variables influenced little changes in risk management, but the influences were not statistically significant. Households with more income sources managed risks better.

Of the two communities, Tugen households were found to slightly manage risks better than the Ilchamus. The difference was not significantly high because the

two communities are found in similar ecological conditions with the same socio-economic and physical problems. The slight difference was due to education backgrounds, accessibility to infrastructures, cultural values and agropastoral lifestyles.

Note: In cases where the X2 results were small, the relationships were too weak.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusions

Success of the agropastoralists should stem from well-adapted principles and strategies designed to overcome the harsh and variable conditions dominant in arid areas (Oba & Lusigi, 1987). There is need for greater flexibility in decision making and enhanced ability to utilise all resources available.

The environmental risks, impacting on pastoral households have impoverished the people. Drought and livestock diseases are two major risks which are common phenomena in the area affecting household lifestyles as revealed by the results from the study. This indicates that most pastoralists were poor in risk management. Majority of pastoral household heads demonstrated a low degree of risk management.

Other studies have shown that pastoralists had workable ways of overcoming harsh conditions whenever they occurred such as mobility, livestock diversification, loaning of livestock, and large herd sizes. This pastoral traditional system of managing risks has broken down over the years due to government policies on pastoral communities and the changing patterns of living brought about by the western husbandry styles. The methods used by most of the pastoralists for risk management were not in line with the modern economic production at the household level. A good example is migration. Many household heads cited migration as a means of surviving drought but this method may not

be no longer ecologically viable at present because of reduced land size. Migration occurs more among the Ilchamus than among the Tugens.

As far as disease management is concerned, the results indicate that the majority of pastoralists used ethnoveterinary ways of disease prevention and treatment. This method is cheap and less involving compared to modern veterinary methods, which are too costly for them. Lack of modern veterinary services coupled with the high cost involved were some of the reasons for the loss of large number of livestock in the study area. Most of the households were too poor to spend expensively on livestock treatment.

The pastoralists have been disadvantaged especially in the field of education, and other developmental aspects that have failed to address the practical pastoral lifestyles. There has also been the breakdown of complementary roles played by men and women at household levels. Women have been disadvantaged more, and yet, women contribute fifty percent of household economic production.

The study has shown that the majority of the household heads had poor education backgrounds, and yet education is an essential ingredient for the present economic survival. The results also indicate that there was disparity in education between men and women in the study area. Women did not have the same opportunities with men in the field of education. Although some households interviewed had children going to school, the majority dropped out of school because they lacked money to pay school fees for their children and also to buy uniforms. This indicates the poor economic situation (high poverty level) in the area. Poor education in the households was also coupled with traditional herding of livestock where boys were pulled out of school to herd livestock with their

fathers especially during drought and the girls were either married young for bride price or helped with household chores.

Education plays an important role in labour export. The results have shown that there were few households with persons in labour export, meaning that there were few household members educated at higher level to compete in the employment market. It was also noted from the results that majority of the household heads interviewed were young parents and could not to go for labour export. This was why labour export was not statistically significant as far as risk management was concerned, although it had brought some differences in the lifestyles in households with labour export.

Since there were few persons in labour export, remittances sent to the households were not statistically significant in the management of risks although there was some difference between households receiving remittances and those not receiving remittances. The persons in labour export plough money back into the household, and the money is used to pay school fees for migrants' relatives at home, invest more in livestock, start other income generating activities, improve the home, farming business etceteras. Many household heads indicated that remittance was used mainly for basic needs and little was used for investments. It also showed that men were decision makers on how remittance is used in the households especially those headed by men. The question of who is a better manager between men and women headed households needs more study. One most important factor, which came out as statistically significant in risk management, was income diversification. In the range lands, livestock production which has been the pastoralists' way of life is now threatened by risks such as drought, livestock diseases, reduced land size,

increased population and adapting new living styles which view livestock activities as backward. Pastoralists are beginning to get involved in other income generating activities to cope with harsh local environment. The study indicates that majority of household heads had on average four to six sources of income, few had more than six income sources and less than four. The average four to six sources of income per household showed a better and positive trend in risk management.

The findings have shown that men were more involved in income generating activities than women. The results suggest that women were likely to be better risk managers than men. If women were given equal education and other opportunities with men, the results suggests that they would use their skills in more income generating activities and turn their income into household productive use. Other studies have shown that men tend to use most of their income in unrelated household activities compared to women. In rural areas, women have an access to some kind of productive resources or particular market, which provides them with an income of their own. But almost everywhere, that income seems limited, and earning it absorbs time and effort that has to be integrated with household keeping and child care (Margeret & Sharon, 1995). Most women in the rural area are self-employed, since discriminatory hiring policies and the lack of education and training often bar them from available wage/ salaried paid jobs (Margeret & Sharon, 1995). These results are in agreement with the results in the study area where 38% of the working women were self-employed compared to 15% of the working men. Women were more in self-employment than men.

The results have shown that Tugen household heads have more income generating activities than Ilchamus community. The reason is that Tugen were more educated and more of agropastoralists than the Ilchamus. There are also few Tugen housewives unlike the Ilchamus where more women household heads are housewives. The tradition of Ilchamus is that the role of women is restricted to household chores and allows less women participation in activities outside the home.

In conclusion, the Baringo agropastoralists have taken various initiatives to supplement their livestock income. It had been foreseen earlier by Little, (1985) that more and more Ilchamus households would engage in non-pastoral income generating activities (petty trades, fuel/firewood production wage/salary labour) in response to increasing human population and diminishing grazing lands just like their neighbours the Tugens. Results indicate that more and more adult males were migrating to urban centres and other irrigation schemes in search of salary/wage labour. Migration was only known for people moving with their livestock in search of pasture and water. Labour export has become one of the most important means of Baringo pastoralists to augment their food supply and income. Education level of the labour migrants has posed as a hindrance to proper risk management.

Many Ilchamus and Tugen households were engaged in cultivation. This appeared to be of more spontaneous response to drought events and food insecurity. However, the problem with cultivation is that it is equally sensitive to environmental conditions than livestock. Most of the households were engaged in irrigation farming, which was limiting due to financial constrains. The high level of illiteracy among the Ilchamus may constrain

adoption of innovative risk management The economic production is changing from traditional livestock economy to market oriented economy with new institutions in place. Many household members in the labour market have become absentee herdowners (keep livestock with contracted herdsman while in salary/wage employment). The findings were in agreement with work done by Little (1985). Gender role in household economic production is beginning to take root. Women are now engaged in non-pastoral activities. Women are migrating to urban centres for labour export. The study did not examine economic contribution by every individual household member (need for more research). Socio-economic and environmental impact of diversification in general and impact of credit facilities, who benefits and who loses, the poor the middle class, the wealthy, the rural and the urban populations need to be studied.

The methods used to manage household risks by the agropastoralists were not in line with more market oriented economy, therefore, they were not sustainable. Such economic practices as provision of relief food, keeping large herds, migration, ethnoveterinary medicine, and conventional veterinary medicine, petty trading and much more need review. The review should aim at finding ways of improving some, while, others should be discarded. Education programmes addressing practical values and needs of pastoralists should be considered along with gender roles in household production.

5.2 Recommendations

- There is need to have environmental education or awareness programme to moderate modernisation so that traditionally sustainable practices are not overwhelmed by exploitative forms of resource management.
- High level of poverty due to harsh environment plays a very negative role in increasing school dropouts. Most parents are interested in educating their children but the problem is lack of finance to meet the cost of education. The government and other donor agencies should put in more money towards aiding education and developing infrastructure geared to improving education which is a long term objective rather than solving pastoralists immediate problems in form of food aid which is a short term objective.
- Parents should be encouraged to take Children who drop out of school either in primary or secondary for one reason or the other for vocational training in youth polytechnics and middle level colleges such as Baringo Technical college in preparation for the development of the industrial sector, and to participate in jua kali sectors (small scale cottage industries) or labour market for competition
- For sustainability of pastoral lifestyle change is inevitable; improved modern education, improved infrastructures (roads, water systems etcetera), health care, veterinary services, should be high on government agenda.
- Cultural ties that hinder female education and opportunities in labour market should be discouraged and women should be encouraged to compete with men.

- Motivation of women is essential, as they are major players in household economic production.
- It was found out that most of the water taps in the area were dry and the pastoralists faced acute water shortage for domestic and livestock use. There were also problems of silting of rivers that would otherwise provide water. It is recommended that several large dams be built along the major rivers for example Perkerra. Three dams should be built along a river in series. The first dam would be built to hold the silt, the second dam is to hold less silt and the third dam would have reduced silt. This would ensure a continuous supply of water.
- The fresh water from Lake Baringo should be utilised and supplied to the study area since the area has a fairly gentle terrain.
- Rehabilitation and extension of piping systems to carry water to serve more people before new schemes are embarked on. Large storage tanks need to be erected to serve the area. Simple technologies like roof and rock catchment, shallow wells, construction of pans should be encouraged at household and village levels.
- Policies on land tenure such as the issuing of title deeds should be hastened for the purposes of obtaining loans and other credit facilities to enable them to improve on agricultural, livestock production and small-scale entrepreneurs. Women should be considered in the issuing of loan facilities.
- Need to provide marketing skills for small-scale business people with a view to improve on the marketing of their locally available produce, thus maximising profits for farmers and enhancing savings.

- To increase livestock production more dipping facilities need to be constructed to control livestock diseases, which is a common risk in the area.
- Most of the honey sold in the area comes from Ukambani, and little is produced in the area. Few people were found to be dealing with selling of honey. Extension services should be availed to encourage farmers to use modern beehives and honey refining facilities and also establish co-operatives to help the farmers sell honey products.
- Ethnoveterinary medicine was found to be widely used by the pastoralists in the study area. The government should come up with a policy, with the view of encouraging and improving ethnoveterinary services for its cheapness and availability.

REFERENCES

Aboud,A.A.,Fatuma, A.and Milena,H.(1996). Pastoral Lifestyle and Development Paradigm. *The Contradictions and Conflicts.* Kenya Pastoral Forum,Nairobi

Barbara, K. H. and R. K. Shahidur (1991). *Womens' work education and Family Welfare in Peru* World Bank Discussion Papers.116Washington DC

Baringo District Development Plan. (1999 – 2001). District Office Kabarnet. Baringo District. Pp 1—40.

Barrow, G. E. (1996). *Drylands of Africa Initiatives Publishers Ltd Nairobi, Kenya IUCN, P.O. Box 68200 Nairobi Kenya article on Gender and Dryland Natural Resource Management,* BAOBAB No. 25 March 1998.

Bekele, T. (1998). In BAOBAB No. 25 March 1998 *Arid Lands Information Network.* Dhakar, Senegal.

Bezuneh, M. and B. Deaton (1997). Food Aid Impacts on Safety Nets: Theory and Evidence—A Conceptual Perspective on Safety Nets. *American Journal of Agricultural Economics 79:672-677.*

Buvinic, M., M. A. Lycette and W. P. McGreevy (1983). Women *and Poverty in the Third World.* Baltimore: Johns Hopkins University Press.

Carr, M. and R. Sadhu (1988). *Women Development and Rural Productivity. An Analysis of the Impact of Time and Energy Saving Technology on Women,* New York: UNIFEM Occasional Paper.

Casley, D. J.and D. A. Lurry (1987). *Data Collection in Developing Countries.* Clarendon Press, Oxford.

Clark, M.H. and L. B. Rae (1989). *Technical Report on Gender and Development Office of Women in Development Agencies for International Development.* University of California, San Diego

Coppock, D. L. (1994). The Borana Plateau of Sourthern Ethiopia: Synthesis of Pastoral Research, Development, and Change, 1980-1991. System Study No5. International Livestock Center for Africa, Addis Ababa, Ethiopia.

Dankelman, I. and J. Davidson (1988). *Women and Environment in the Third World.Alliances for the Future.* London: Earthscan/IUCN.

Ellis, J., K. Calvin, G. T. McCabe, and D. M. Swift (1987). *Pastoralism and Drought in Turkana District of Kenya,*_A Report to NORAD pp 150. Development Systems Consultants Inc Bellevue Colorado.

FAO and SIDA.1989. *Restoring the Balance. Women and Forest Resources.* Rome: FAO and SIDA

Farah,K.O., E. M. Mutungi, and Nashon K. R. Musimba(1996). PINEP, University of Nairobi, Department of Range Management, Nairobi, Kenya.

Fatau, S. (1987). *African Development.* A Quarterly Journal of the Council for the Development of Social Sciences Research in Africa, Vol. XXIII, Nos. 3&4, 1998

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

Gilani, I., M. F. Khan and M. Iqbal (1981). *Labour Migration from Pakistan to the Middle East and its Impact on the Domestic Economy.*" Final Report, Research Project on Export of Manpower from Pakistan to Middle East. Washington DC.The World Bank.

Gladwin, C. H. (1990). *Structural Adjustment*, Women Farmers, Gainesville, University of Florida.USA.

Goldin, C. (1986). *Female Labour Force and American Economic Growth.* In Long Term Factors in American Economic Growth, edited by Stanley Engerman and Robert Gallman Chicago: The University of Chicago Press.

Greenhalgh, (1985). *Sexual Stratification: The Other Side of Growth and Equity In East Asia Population and Development* Review II,(2) :265-314.

Jacob, A. H. (1965). *The Traditional Organization of the Pastoral Maasai* PhD Dissertation. Oxford University.

Jahnke, H. E. (1982). *Livestock Production Systems and Livestock Development in Tropical Africa.* Kieler Wissenschaftsverlag Vauk, Kiel, Federal Republic of Germany.

Jowkar, F. (1994). Women Bear the Brunt. *Our Planet*, Vol. 6 No.5 pp4 Nairobi Kenya.

Kituyi, M. (1990). *Becoming Kenyans: Socio-economic Transformation of the Pastoral Maasai. Nairobi*: ACTS Press (African Centre for Technology Studies).

Little, P. D. (1985). Absentee Herdowners and Part Time Pastoralists*: The Political Economy of Resources Use inNorthern Kenya. Human Ecol. 13: 131-151.*

Little, P. D. (1992). *The Elusive Granary.* Herder, Farmer, and State in Northern Kenya. Cambridge: Cambridge University Press.

Little, P. D., B. Cellarius, C. Barrett and D. L. Coppock (1999). Economic Diversification and Risk Management Among East African Herders. Preliminary Assessment and Literature view. GL- CRSP.*Pastoral Risk Management Project Technical Report 02/99. Utah State University, Logan 40 pp.*

Lycette, M. (1984). *Improving Women's Access to Credit in the Third World: Policy and Project Recommendations.* ICRW Occasional Papers, No. 1 Washington D.C. International Centre for Research on Women.

Margeret, J.H. and S. Sharon (1995). *Women in Rural Economy African Women South of Sahara.* Longman Publishing New York USA

Masale, E. M. (1985). Commission for Social Services. *Women of Kenya 1985.* Nairobi University Press.

Masinde, J. R. (1987). *Determinants of Women's Groups Performance and Their Implication for Rural Development Planning.* M.A. Thesis, University of Nairobi.

McCorkle, C. .M. and E. Mathias-Munday (1992). *Ethnoveterinary Medicine in Africa.* Africa 62(1): 59-92.

Njoka, T. J. (1979). *Eclogical and Socio-Cultural Trends of Kaputiei Group Ranges in Kenya.* PhD. Thesis, University of California, Berkely, U.S.A.

Oba, G. and W. J. Lusigi (1987). *An Overview Drought Strategies and Land Use in African Pastoral Systems.*Pastoral Development Network, ODI.23a.

Palmer, (1991). *Gender and Population in the Adjustment of African Economics,* Geneva, ILO. (International Labour Organization).

Rao, A., F. Hillary and K. Cloud (1991). *Gender Training and Development Planning.* Learning From Experience, The Population Council; Conference Report May 1991 Bergen Norway.

Rigby, P.J.A. (1969) *Cattle and Kinship Among the Gogo: a Semi-Pastoral Society of CentraL Tanzania.* ITHACA, London: Cornell University press.

Sivard, R. (1985). *Women Award Survey.*Washington, D .C.: World Priorities.

Sofranko, A. J. and K. Idris. (1999). Use of Overseas Migrants' Remittances to the Extended Family for Business Investment: A Research Note; Cited in *Rural Sociology: Official Journal of the Rural Sociological Society, Department of Sociology,* Western Washington University, 516 High St. WA Vol. 64 No. 3 PP 464—481.September 1999.

Staudt, K. (1975). *Women Farmers and Inequalities in Agricultural Services.* Rural Africana 29, Winter.

United Nations (1987). *Fertility Behaviours in the Context of Development. Department of International Economic and Social Affairs.* New York. U.N. (ST/ ESA/SER A/ 100).

Vedeld, P, and F. W. Luseneka (1991). *Agriculture and Social Change In Kenya: A Case Study of Household Resources Allocation in Semi Arid Baringo District.* pp 1-40. In Management of Natural Resources Articles/Summaries from M.Sc. Theses, 1988: Case studies.

Vlakveld, S. and H. R. Scheffer (1992). *The Situation of Pastoral Communities in Monduli District.* Report on collected data submitted to Ministry of Agriculture (MOA) Tanzania. In Press.

Ward, B. & R. Dubos (1972). *Only One Earth .The Care and Maintenance of a small Planet.* Harmondsworth: Penguin Books.

Were, G. (1985). *Women and Development in Africa.* East African Journal Research and Development Volume 15, 1985.Published by Gedeon S. Were Press. Nairobi.

APPENDIX A

List of variables on the working file

Gender of household head

1 Male

2 Female

Gender of labour export

1 Male

2 Female

Education level of household head

1 Illiterate

2 Primary 1 -4

3 Primary 5 _ 8

4 Secondary level

5 Post secondary /college

Age of household head

1 young adult (19 – 39 years)

2 Middle aged adult (40 – 60)

3 Old adult (>60)

Occupation of household head

1 Permanently in employment

2 Contract

3 Self employment

4 Herder only

5 Herder/ farmer

6 Housewife

Size of household

Education level of persons in labour export

(Same rating as education of household head).

Household education of both household head and labour export

1 1-5 scores

2 6---10

3 11-- 16

4 17 21

Labour export (number of persons of the household working a way from home.

0 No labour export

1 Labour export

Household heads receiving remittance

1 Yes

2 No

3 none

Amount of remittance received by the household head

0 No remittance

1 Low remittance

2 High remittance

Number of sources of income per household head

1 0 – 3 Low income sources

2 4 – 7 Moderately low

3 7> high income sources

Types of income sources

1 large stock

2 Small stock

3 Crop farming

4 Salary/wage

5 honey sales

6 Charcoal sales

7 Craft sales

8 Petty trades

9 Rental houses

10 Transport

Drought (Risk) management by

1 migration

2 Destocking

3 Buy and store fodder

4 Obtain money from other business

5 Sell animals in bad years.

Disease management

1 Use veterinary services.

2 use ethnoveterinary

3 do all the a bove

Famine management

1 increase sources of income

2 Buy and store in safe places

3 Relief food

4 Borrowing

5 None at all

Raiding management

1 Provide security

2 Enclose livestock

3 None at all

Risk management

1 low risk management

2 High risk management

APPENDIX B

QUESTIONNAIRE INSTRUMENT

Dear sir/madam

The purpose of this study, and hence this questionnaire is to examine the impact of gender and education on household pastoral risk management. Your contribution towards this study is very important therefore request your co-operation, honesty and patience in answering the following questions. A good response will go a long way in assisting me to draw accurate conclusions and recommendations from the current study, which will eventually improve pastoral lifestyles in reducing risks. I assure you that the information you provide will be treated with utmost confidentiality.

Please tick ----- your choice (s) under each item of questions provided.

HOUSEHOLD CHARACTERISTICS

A HEAD OF HOUSEHOLD

Respondent No.----------Name (optional)...----------

Sex 1. Male..... 2. Female.....Age.....

Marital Status: 1. Single 2. Married... 3.Divorced...4.Seperated... 5 widowed

Occupation of household head.....

Ethnicity: 1. Ilchamus..... 2. Tugen..... 3 Other (describe) .....

Size of household 1.Males..... 2. Females ..... Total.....

Division..... Location.....

Education

Education	Level attained (in years)	Year of completion
None Primary level		-
Secondary level		
Tertiary college		
University level		
Postgraduate level		

2 Do you have children attending school? Yes-------- No ----------

3. Are there problems you face in educating your children?

(i) yes---------- (ii) no ----------

4. What problems do you face in educating your children if any?

(i)----------

(ii)----------

(iii). ----------

(iv)----------

(v)----------

5. Indicate the reason why you take your children to school?

(i) they are source of future investment

(ii) to increase income into the household.

(iii) For them to get better employment

(iv) Helps to diversify household income

(v) Because it is the government policy.

Labor export/Remittance

1. How many people from your household are employed outside division?.....

2. How many non -household members have you contributed to their education are employed outside the division? ---

3 How did you contribute to his/her education? ----------

4 Please fill in the following details for each of the household members who have migrated to labour markets:

Persons	Gender	Education	Age	Occup-ation	Location Of work	Salary/ Wage/ month	Remittance in Past one year	Uses	Remittance regularity
1									
2									
3									
4									
5									
6									
7									
8									
9									

Remittance regularity: 1.every month 2. Less than 6/12 3. More than 6/12

5. You receive more remittance from hh members who are: 1.Self-employed 2 Permanent employed 3. Employed on contract

6. Who makes the decision on what to spend the remittance on ? ----------

1. Sources of household income

I receive income from the following sources in the past year?

Activity	tick	If yes amount earned/day/month	# of times sold in past year	amount earned	uses
salary labor	Y N		----------		
Waged 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 meat	Y N				
Sale of firewood/ Charcoal	Y N				
Sale of hides/skins	Y N				
Craft sales	Y N				
Trading	Y N				
Crops sale	Y N				
Bees harvest (honey)	Y N				
Other					
Total					

2 Other Sources of income

Crops for consumption	Planted area in past year	Harvested qty	Total amount earned	uses
Vegetables				
Maize				
Millet				
Beans				

3 Of the amount earned how much did you spend on the following;

Uses of income per month	Total spent in Kshs
Invest in to business	
Expenditure on health	
Expenditure on cloths	
Expenditure on food	
Expenditure on education	
Expenditure on hired labor	
livestock management: vet drugs,salts, feeds, water	
Relatives	
Savings	
Purchase of land and other assets	
Purchase of livestock	
Other (specify)	

1. Livestock investment

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

2. Describe your current herd size and changes in the past year.

Type	breeds	Current #	lent	borrowed	inherited	eaten	born	died	stolen
cattle									
Sheep									
goats									
donkeys									
camels									
poultry									
bees									
Others (specify)									

1- Breeds of cattle: 1-african zebu 2-sahiwal 3-boran 4-exotic breeds 5- crosses

Breeds of sheep: 1-red Maasai 2- dorper 3- crosses

Breeds of goats: 1- small E. A. goats 2- Galla 3- crosses

3. Who spends most of the time looking after the livestock?.....
4. Reasons of keeping livestock.....
5. What season do you sell most animals?.....
6. Why do you sell your livestock?.....
7. Who controls the income from livestock sales? 1. Husband 2. Wife
8. Were there any sales done other than by household head? 1 yes ... 2 no
9. Who did it ? .....
10. What are your sources of money to buy livestock?.....
11. Why do you buy if you already have others?.....

1. Other investments and assets diversification

Assets check list:

Assets check list	Circle/Tick	Location in relation to home. 1.Home area 2. Away	Amount invested (Kshs)
House	Y N		
Store/ granary	Y N		
Rental houses	Y N		
Trading premises	Y N		
Public transport	Y N		
Bicycle	Y N		
Motorised vehicle	Y N		
Farm	Y N		
Lantern	Y N		
Jembes/Panga	Y N		
Wooden beds	Y N		
Wooden chairs/tables	Y N		
Other (specify)	Y N		
Total		# at home # away	

2. Why did you choose to invest away from home?.....

3. What drives you to diversify your assets?.....

1. Risks/ uncertainties

Common risks you encounter as herder

Risks	Circle/Tick	If Y, severity[1]	#animals lost	Management of risks
Drought	Y N			
Famine	Y N		--------	
Disease	Y N			
Raiding	Y N			
Market prices	Y N		---------	
Other (specify)				

Degree of severity 1-very severe 2- severe 3- not severe

2. During the period of drought how do your assets/ sources of income assist you? .....

3. Socio- economics indicators table

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

4. What are the common sources of food during time of crisis?

1.....2.....3.....4.....

.....

5. What do you do to recover after crisis during