FARMING SYSTEMS AND HOUSEHOLD FOOD SECURITY IN KASIKEU DIVISION OF EASTERN PROVINCE, KENYA

BY

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DECLARATION

This thesis is my original work and has not been presented for the award of a degree in any other institution.

Elizabeth Kitunge Ngalu _____ 29/9/2011

Signature Date

This thesis has been submitted with my approval as the University Supervisor.

Professor Simiyu Wandibba _____ 29/9/11

Signature Date

DEDICATION

To the Almighty God, who gave me the strength.

To my family, who encouraged me to continue to the end.

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ABSTRACT

This study examined the relationship between farming systems and household food security in Kasikeu Division of Eastern Province. The study sought answers to the following questions: One, how does the farming system employed by households in Kasikeu division affect household food security? Two, what are the constraints faced by these households in the production of their food? Three, how do patterns of land ownership and use in the division affect household food security?

The study's main objective was to explore the relationship between farming systems and household food security in Kasikeu Division. Specifically, the study had the following three objectives. One, to investigate how the farming system employed by the households in Kasikeu division affects household food security; two, to examine the extent to which the constraints faced by these households impinge on household food security; and, three, to describe how gender disparities regarding land ownership affect household food security in the division. The study was guided by the theory of functionalism, which states that culture functions to meet the needs of individuals such as nutrition.

The study was done between January and April 2001, and the target population consisted of rural households that practise farming in Kasikeu division. A sample of 100 farming households was used in the study, with household heads acting as respondents. The study elements were selected using cluster and systematic sampling strategies. Data were collected using structured interviews, focus group discussions, key informant interviews, observation and secondary sources. Quantitative data were analyzed using the SPSS computer programme whilst qualitative data were analyzed according to emerging themes using content analysis.

The main findings of the study are, one, households in the study area largely depend on farming for their livelihood. However, they are food-insure due to several constraints they face such as farming systems which depend on inappropriate technology and therefore farmers cannot produce food in sufficient quantities. The situation is aggravated by unpredictable weather conditions and lack of market outlets with stable prices. Two, farmers are forced by circumstances to dispose of any surplus produce. They have to sell surplus food to buy other essential commodities. Three, the land tenure system is a disincentive to agricultural production, since it places land ownership in the hands of men who play an insignificant role in food production.

On the basis of these findings, it is concluded that the farming system employed by these households does not provide them with sufficient food to guarantee a healthy nutritional status. Other factors such as unpredictable weather conditions, lack of appropriate market outlets, exclusive dependence on rain-fed agriculture, the traditional land tenure system, and lack of cash crops also contribute to the production of insufficient food stuffs.

The study, therefore, recommends that the government and its development partners, should come up with strategies to empower women so that they can produce sufficient quantities of food for their families.

ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ASAL	Arid and Semi-Arid Lands
ANP	Applied Nutrition Programme
FAO	Food And Agricultural Organization
IMF	International Monetary Fund
HIV	Human Immunodeficiency Virus
SAPs	Structural Adjustment Programmes
UNIFEM	United Nations Development Fund for Women
UNICEF	United Nations Children's Fund
WHO	World Health Organization

CHAPTER ONE

BACKGROUND TO THE STUDY

1.1 Introduction

This study looked at farming systems and household food security in Kasikeu division of Eastern Kenya. Kasikeu division is in Makueni district, and it occupies an area of 7,965 square kilometres. The district has sixteen administrative divisions, Kasikeu division being one of these divisions. The district has semi-arid vegetation, with low and erratic rainfall. Hence the people rely on an inadequate, fragile and uncertain resource base under constant threat of drought, resulting in food insecurity and under-nutrition. Makueni is one of the most food-insecure areas in the country (Kenya, 2005a). This is due to a number of factors such as frequent droughts, high cost of inputs, lack of planning on the part of the Government on how to ensure that food production is at par with the population growth, inadequate purchasing power on the part of households and poor distribution of food aid when there is food shortage. Additional problems are inadequate access to productive resources by women, landlessness, incomplete land adjudication, poor crop varieties, inadequate access to farm inputs, and underdeveloped markets due to poor infrastructure in the district (Kenya, 2010a).

A farming system or agricultural production system is a bio-economic activity in which the farmer or farm family manages certain resources to produce food, feed, fiber, shelter and other necessary products The objectives of these farming households include not only production for subsistence but also for sale in order to be able to meet other needs besides food. Food security can be improved by increasing food production and also enhancing a people's purchasing power (Okigbo, 1986).

Reutlinger and Pellekan (1986) define food security as the ability to meet target consumption levels in the face of fluctuating production, prices and incomes, together with ensuring absolute availability at any price. Food security thus refers to the access to food in sufficient quantities and qualities at all times to enable people lead an active and healthy life. There are two forms of food insecurity – transitory and chronic.

FAO (1997) defines the objective of food security as assuring to all human beings the physical and economic access to the basic foods they need. This definition implies three different aspects of food security, namely, availability, stability and access. Household food security is the ability of the household to produce or buy adequate, safe and good quality food to meet the dietary requirements of all its members at all times (Kenya, 1994b). This definition is similar to the one given by FAO/WHO (1992) which is that, at the household level, food security is a state in which households have continuous access to food supplies which can fully satisfy the nutritional and dietary needs of all its members at all times. The definition by FAO (2002) introduces the concept of food preference as key to defining food security.

Food security at the national level is perhaps best described as a satisfactory balance between food demand and food supply at reasonable prices (Thomson and Metz, 1997). Though this definition is unclear, it is intended to indicate a situation where there have been no major upheavals in food markets in the recent past, where adequate food is available and where most of the population has access to that food. In the definition given above, changes in food security can be identified overtime by rising food prices. This will affect the poorest first, as they spend a higher proportion of their income on food. The household level of food security is probably the

most important for the analyst, insofar as the household is the basic economic unit, which determines the level of consumption by the individual (Thomson and Metz, 1997).

1.2 The Food Situation in Kenya

Ensuring food security and eliminating hunger is a big challenge for the country. More than 40 per cent of the population lacks access to adequate food due to poverty (Kenya, 2008). At present, reports in the media show that millions of Kenyans are in dire need of food aid in the country. There is acute drought which continues to be experienced in many areas of the country. The prices of maize flour, which is staple food in many households, are at unprecedented levels. The debate as to whether to import genetically modified maize for milling and rationing of the amount of maize flour for those buying from shopping stores paints a grim picture of the food situation in the country.

Agriculture is one of the key sectors in the country with great potential for growth, and it is said to contribute about 24 per cent of the Gross Domestic Product, 75 per cent of industrial raw materials and 60 per cent of the export earnings. Further, the agricultural sector is acknowledged as one of the major employers of rural people, with an estimated 3.8 million Kenyans directly employed in farming, livestock production and fishing, while another 4.5 million are employed in off-farm informal sector activities (Kenya, 2008).

Though the Government has proposed in its Food Security and Nutrition Policy the development of a strategic food reserve which will expand the current strategic reserve to include other food commodities such as powder milk, rice, pulses, meat and a reserve (cash) fund, the agricultural sector continues to be constrained by a number of factors. These are high cost of inputs, limited application of agricultural technology and lack of innovation, whereby many

farmers lack adequate capital to adopt new technology or apply recent innovations in agriculture (Kenya, 2008).

Additional challenges are weak farmer institutions where a number of cooperatives have experienced mismanagement thereby resulting in the collapse of many such institutions. Poor livestock husbandry practices, limited extension services due to low funding, poor post-harvest handling. low marine fish export, lack of market-driven production as well as limited access to business development services by farmers, are issues identified as affecting increased agricultural production in the country. Over-dependence on rain-fed agriculture implies that any poor weather conditions will inevitably cause heavy losses in the production of crops and cause massive livestock deaths and famine. Many farmers who are able to afford credit, have no funds to invest in improving their agricultural productivity because of few credit facilities (Kenya, 2008).

Food insecurity is a major problem in Africa and is largely caused by poverty, inadequate food production and ecological changes brought about by increasing population pressure. The food insecurity problem may be aggravated by political upheavals (Gehart, 1986). An example is the 2007 ethnic clashes that led to displacement and made households that were previously economically stable, poor.

The factors that influence agricultural production and are under the control of households include land, labour and capital, along with management. However, there are also external factors which are beyond the farmers' control. These are largely beyond the control of the individual-farming households but influence what its members do. They include community structures, norms and beliefs. There are also external institutions or support systems and miscellaneous influences such as location and population density, institutions that supply households with inputs and provide markets for the produce and infrastructure (Peters, 1986).

There are several reasons as to why there is a strong emphasis on agricultural productivity. First, food production in developing countries is not keeping pace with population growth, the poor segments of the food insecure population lack purchasing power to buy food from the market and increase in total world food production cannot guarantee access to the resource poor households because of their lack of the means to buy. For many of the poor, increasing agricultural production represents the best (or only) opportunity for meeting their food requirements and for earning incomes to meet other needs. An income from the farming households enables them to pay the landless and other individuals who provide labour to be able to get an income (Gehart, 1986).

The benefits of high incomes from increased agricultural activities in developing countries are various and they include employment opportunities from the farms as well as the agro-based industries, growth of industries which process the raw agricultural materials and foreign exchange from exported goods. This would lead to reduced poverty levels, both in the rural and urban centres. Increasing agricultural productivity also merits attention because it is an effective way of achieving higher incomes for the producers (Gehart, 1986).

Most farmers in developing countries are resource-poor; they lack the land, water, implements, and labour and/or management skills necessary to farm successfully. Many of these households live in marginal environments with poor soil, high temperatures, high levels of diseases and pest, low or unreliable rainfall, severe slopes, serious soil erosion or other natural problems. Small farmers may be willing to adopt a new agricultural technology provided that it is socially and economically beneficial to them, as long this technology guarantees inputs that are easily accessible, such as water and fertilizer (Gerhart, 1986).

Many times, the income that comes to the households is assumed to benefit the entire household and that resources are allocated consultatively according to the needs of the members. However, there are some occasions when none of these assumptions are valid. The main determinants of insufficient food consumption are unreliable seasonal variations, food distribution (infrastructure), lack of food storage facilities and availability of food. Though some of these risks are more likely to occur than others, this depends on the extent of climatic variation in a country or region, the stability of the state and of community institutions and the extent to which the households are involved in markets, which have historically been subject to major fluctuations (UNIFEM, 1986).

At the national level, food security entails adequate food supplies through local production, storage, food imports and food aid. However, adequate availability of food at national level does not necessarily translate into equitable distribution across the country or access among all households given that the poor households may not have money to buy the food they need (Kenya and UNICEF, 1998). Pictures from the Kenyan media of people starving in Turkana when food is stocked in shops and grain reserves is an illustration of the need for empowerment of those households whose sources of nutrition are threatened or even eroded. The number of Kenyans affected by famine keeps on rising every day.

A decline in the production of maize is interpreted as a sign of food insecurity in Kenya. However, there are drought resistant crops such as sorghum, millet, sweet potatoes and cassava that do better than maize during the bad years. The lack of promotion of these drought resistant crops has resulted in diminished production of traditional food over the years. This is a matter of concern because maize, which has replaced these crops, is more dependent on regular rainfall (Kenya and UNICEF, 1998).

The agricultural sector has been badly affected, with notable short falls and escalating prices. Agriculture is such a dominant feature of the economy that its fortunes or misfortunes impact greatly on its performance. As drought continues to bite harder, agricultural production has declined and overall economic growth expectations have been downgraded (*The Daily Nation*, September 24, 2000).

Households in the drought-prone areas are extremely vulnerable as they are affected by fluctuations in climate. Consecutive droughts over the years have resulted in erosion of the economic base of most households. A survey carried out in 10 drought-prone districts by ANP/UNICEF in 1997, revealed that over 50 per cent of households have not made any specific preparations for the most recent drought, even though they had advance warning. This study further stated that these households had no productive assets that could be exchanged for food, an indication that their coping strategies had eroded. The number of Kenyans depending on food relief offers an insight into the situation. During the 1994 drought, for example, two million people in the 16 ASAL districts were under the famine relief programme while at the height of food shortages in 1993 up to 5.4 million Kenyans were affected (Kenya and UNICEF, 1998)

1.3 Food consumption patterns in Kenya

Maize is the staple food for the majority of Kenyans, and thus the chief source of the energy pattern for both the rural and urban populations. The average smallholder in the rural areas of Kenya obtains a large share of daily energy intake from a limited range of foods. This is made up of about 61 per cent from cereals, 12 per cent from root crops, 5 per cent from beans, 5 per cent from sugar and 4 per cent from milk. These foods represent 87 per cent of the total energy intake for the rural communities. The limitations in the variety of crops grown in most rural areas are likely to reflect monotony in the diets, which may also be limited in quality (Kigutha, 1995).

Poor households in Kenya's smallholder areas suffer from food shortages some of which can be acute, but the grossly inadequate intake of food that is prolonged enough to show up in high incidences of severe malnutrition is rare (Heyer, 1990). Different estimates of poverty in smallholder agricultural areas suggest that more than 25 per cent of the rural agricultural households are poor enough not to be able to afford what is regarded as minimum food requirements (Heyer, 1990).

1.4 Food situation in the area of study

Crop farming in Makueni District is mainly for subsistence purposes. It is estimated that over 60 per cent of the population in the district depend on crop and/or livestock related activities for their livelihood. The district is over-dependent on cow peas, maize and beans as well as pigeon peas. The main livestock kept are poultry, goats, cattle and sheep. In terms of climate, the area of study experiences two rainy seasons, namely, the long rains occurring in March/April and the short rains in November/December. The hilly parts of the district receive about 680-720.2 mm of rainfall per year. The rainfall is inadequate and unreliable and therefore drought is a major cause of poverty in the district and affects mainly women, children, the aged and the disabled. The community consumes most of the income during famine, leaving very little saving that could be ploughed back as a form of investment. Makueni District also experiences problems of storage of farm produce especially maize when there is a bumper harvest, and this has contributed to aflatoxin cases being reported in the district (Kenya, 2009).

The district experiences high levels of poverty currently standing at 73 per cent. The people engage in charcoal burning as a coping mechanism. Those classified as poor in the district experience both absolute poverty, evident in their lack of access to food. The absence of rural micro-industries has led to low incomes and high levels of unemployment. Lack of and/or slow

pace of rural electrification, which is necessary to steer and bolster local industries such as Jua Kali has contributed to the low employment rates in the informal sector. This high unemployment rates have led the youth, who are the productive population, to migrate to the urban centres. leaving the less able and aged in the villages. Poverty is more severe amongst the women, and this is attributed to inequality and limited access to land, ownership of assets, income generating opportunities and decision-making (Kenya, 2009).

Poor infrastructure, lack of pasture and water, inappropriate farming methods, lack of appropriate drought-tolerant seeds and inadequacy of water for domestic and irrigation are challenges that households in the area face. Accessibility of credit to the local people has always been difficult owing to the unavailability of title deeds and other collateral, especially among farmers. The lack of or limited existence of organized marketing groups such as cooperatives has been exploited by the middlemen, who exploit farmers to the extent that these farming households cannot get value for their products. This has demoralized farmers, and has been a disincentive to investment especially in the horticulture and livestock industry. Further, it has led to marketing problems especially for livestock and livestock products, as well as maize ((Kenya, 2009).

According to Kenya (2005b), the number of women-headed households is on the increase in the district. Women do not have inheritance rights to their father's and even sometimes to their husbands' land. This leads to the loss of livelihoods by the women and their offspring and is increasing the landless in the district. Land adjudication in the district has not been completed.

Though the households rely heavily on small-scale farming for their livelihood, about 80 per cent of these activities are managed and carried out by women. However, the women do not control the productive assets such as land and capital and thus do not have authority to control

and make decisions on the utilization of assets. In many cases, property is registered in the name of the husband or the first-born son, a tradition that locks out women from accessing credit facilities due to lack of collateral; and has tended to propagate poverty in the district especially among the female headed-households (Kenya, 2009).

1.5 Problem Statement

In this particular division and district in general, farming households are food-insecure. These households practise farming with own crop production accounting for over 60% of the maize and beans consumed. Over 60% of the residents derive their incomes from agriculture (livestock keeping and crop production). Food crop production is carried out mainly for subsistence and is dominated by cultivation of maize, beans, cowpeas and pigeon peas. Low production of these cereals is disastrous for these largely peasant households (Kenya, 2010a).

Reliance on rain-fed agriculture predisposes the households to food crises especially during droughts. This is because over 80% of revenues generated by households is derived from livestock and food crop sectors. Land holdings average one hectare and eight hectares among the smallholders and large-scale farmers, respectively. The poor and women are the most vulnerable, with over 64% of households being female-headed. They are often left by the male youth in search of employment opportunities in towns (Kenya, 2010a).

This is a marginal area and therefore it will require a lot of inputs for the farmers to produce food in sufficient quantities. The need for appropriate technology which is lacking, affects their productive capacity. Unpredictable weather, coupled with the problem of people who are traditionally charged with the responsibility of producing food not being able to own the means of production and, consequently, lacking control over the disposal of what they have

produced led my study to seek to find out the extent to which the farming system and these other factors impinge on the ability of the households to produce sufficient food for their families.

The specific questions that this study set out to answer are:

- To what extent does the farming system employed by households in Kasikeu division affect household food security?
- What are the constraints faced by these households in the production of their food?
- How does land ownership and use affect household food security in the division?

1.6 Study Objectives

The overall objective of this study was to explore the relationship between farming systems and household food security in Kasikeu. Specific objectives were: -

- To investigate how the farming system employed by the households in Kasikeu division affects household food security.
- To examine the extent to which the constraints faced by these households impinge on household food security.
- To describe how patterns of land ownership and use affect household food security in the division.

1.7 Justification of the Study

The findings of this study should be of practical significance especially to the agricultural extension workers and the Ministry of Agriculture who advise farmers on the best ways of maximizing production. Non-governmental organizations working in the area and local leaders could also use these findings to sensitize the community to impress the provisions of the

new Constitution which gives both men and women right to equal treatment regarding land ownership and inheritance so that women's and girls' livelihoods are improved.

Further, I am contributing to anthropological knowledge, development and nutrition. In addition, the Kenya government's effort to meet the ever-increasing demand for food requires a back-up contribution from research.

1.8 Scope and limitations of the study

Although household food security is also influenced by other factors such as off-farm incomes in terms of transfers from other family members, the researcher restricted herself to looking at farming systems. Further, the households studied might not have been very truthful on sensitive issues like food security, and this might have affected the reliability of the data. Further, because I focused on one division, the results may not be generalized to the entire district. However, the findings should spur interest in the topic and therefore motivate other studies in the district and/or province.

The researcher was not in a position to implement any intervention mechanisms because this is a descriptive study. In addition, due to budgetary and time constraints, the researcher could not do a census study though every household has a primary need of access to food that meets dietary requirements to be able to lead a healthy life.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is a review of the literature on the research topic. The literature is reviewed under a number of sub-headings. First, is an overview of the household and what entails a farming system, household food security and the nature of the household. The next is on the major determinants of agricultural productivity, followed by the constraints that farmers face, especially those that are barriers to the production and successful marketing of food.

2.2 Literature Review

2.2.1 The nature of the household

The concept of households is variedly understood. The 2009 Kenya population and housing census referred to a household as a person or a group of persons who live together in the same homestead/compound but not necessarily in the same dwelling unit, have same cooking arrangements and are answerable to the household head (Kenya, 2010b:4). The Rural Household and Expenditure Surveys conducted by the Central Bureau of Statistics define a household as constituting one or more persons who eat together and have a common cash account (Kenya, 1997). In their study on rural landlessness, Alila and associates defined a household as comprising a person, or group of persons generally bound by ties of kinship, who normally reside together under a single roof or several roofs within the same compound and who share community life, in that they are answerable to the same head and share a common source of food (Alila *et al.*, 1993:13).

This study considers the following to be key to the definition of a household: common residence in which economic production, consumption, child rearing, inheritance and shelter activities are organized and carried out. More attention is being paid to the household level when looking at food security since it is the social unit where most people gain access to food. At the national level, food security entails adequate food supplies through local production, storage, food imports and food aid. However, adequate availability of food at national level does not necessarily translate into equitable distribution across the country or access among all households (Kenya and UNICEF, 1998).

However, common residence in the definition of a household is being challenged by transformations brought about by the rural-urban migration. Absent members of households may play a key role in remitting cash, goods and services and may occasionally draw on the households' resources. Their parents and siblings may look up to them for support and/or render them support in case of need, food requirements included (Wilk, 1984).

In spite of these conceptual weaknesses, the household remains essential to understanding food security patterns (Omosa, 1998). This is because it provides a location/place with some boundaries and in the case of this study, land acquisition and use are closely tied to the establishment of a household in rural Kenya.

Women's role in agriculture is key. They play critical and evolving roles in the production of food for the household, in pre-planting and post-harvest activities, in livestock and, increasingly, in cash cropping, in addition to their reproductive and domestic roles such as collecting wood, water, processing and cooking foods. Compared to men within the same household, women have a wider range of activities and enterprises, dissimilar production

constraints and different production objectives. African agriculture is, thus, becoming "feminized" (Ellis, 1988).

Todaro and Smith (2009) estimate that, in addition to the household work, women provide 60 to 80 per cent of agricultural labour in Africa. Thus, since women produce a large share of agricultural output, any successful reform will require raising women's productivity. Perhaps the most important role of women is providing food security for the household. This is accomplished through activities such as raising livestock to augment household assets, and production of different types of food such as vegetables so as to reduce the amount of money that their households would have to spend on such necessities (Todaro and Smith, 2009: 450).

Some of the common characteristics of limited resource farm households in low-income countries generally include access to a means of livelihood in land; they mainly use labour in farm production in conjunction with only small amounts of capital. Further, they are always located in a larger economic system characterized by partial engagements in markets. Such households are often subordinate to some external forces such as climate changes. Concerning land, non-market rights of access or non-price forms of tenure which is in form of inheritance, are more likely to operate than a freehold market (Ellis, 1988).

Ellis (1988), argues that these households have limited access to market information (that is, not available or readily accessible). At times, sharing and reciprocity often exist between the households, in that households without draught power may offer human labour for draught power. Sometimes such relationships exist between households, which are related to each other. Another reason why such households are only partially integrated into the market economy is because they consume a proportion of the products they produce and thus somehow survive independent of the larger system.

Ellis *et al.* (1988) have made important points about intra-household relationships: the economic situation of the individuals within households is influenced by the social norms of behaviour of the society within which they reside. Consequently, specific economic roles are socially assigned to men, women and children. Also, the division of property, labour and income within households is socially and not biologically determined. Sometimes, as a result, males and females within households may have different income streams, with different sources and different destinations. Thus, it may be wrong to assume that male and female labour can substitute for each other across the range of household activities. As a result, rigidities in time allocation may reduce the ability of households to respond to market signals. Such division of labour can impose constraints on seasonal labour inputs and ultimately impact on composition and level of farm output. Because of the above, it is unlikely that increases in household income will benefit all members equally. Women face social subordination in many societies, in such areas as land inheritance and the subsequent use and control of this resource (Ellis *et al.*, 1988).

2.2.2 Farming systems

A farming system may involve growing one or more crops, or mixing to varying degrees the production of commodities with the rearing of animals (Okigbo, 1986). A farm may be owned and managed by a single individual or a farming family. Members of the farm family who may be involved in farm work only when there is sufficient rain, may supplement their farming activities with a range of other economic activities, such as paid manual labour, to be able to supplement their means of accessing food.

According to Moock (1986), African farming systems usually consist of more than one field system, or microenvironment, located at varying distances from each other and from the homestead. There may be variations in the types of commodities produced, the number of

individuals at work, the intensity of farming and the timing of the activities. The farm family at times contracts other people to help especially during periods when farm labour is at peak. The farm activities may involve not only division of labour within the family members but also with the community or adjacent communities, which may not be having enough food. The situation in Africa is even more complex owing to the close ties that exist between family members, and the extended family system and these relations are seen in joint ownership of resources that the farming households have, such as land (Moock, 1986).

Robison (1983) has characterized farms as having objectives and decisions in which a farmer has goals such as the provision of food for the household, together with goods for personal consumption like tobacco or raw materials like wool or materials for building houses. Other important aims are safeguarding the future by accumulation of capital in the form of animals and plantations and the increasing of social status by the accumulation of wealth or by special technical, social and economic achievements. The farm is, consequently, a multi-objective system (Robison, 1983).

The activities of these farms serve to transform inputs into outputs and they include those activities which produce crops, production of fodder for livestock after harvesting, procurement activities including investments, and marketing activities. A significant proportion of the inputs of the household-farm system are, however, produced within the system (labour, seeds, fodder and manure) (Robison, 1983).

These farms are influenced by external factors such as the natural conditions (climate, soil and diseases), which constrain the ecologically feasible activities. Further, the state of knowledge and information about agricultural techniques (innovations) determines the possible physical production functions of the various activities (Robison, 1983). The farmer's choice of the

ecologically feasible activities and possible techniques depends on the institutional environment such as forms of land ownership and or access, farm size, taxation systems, labour laws, credit and extension services and also the accessibility of market outlets alongside the crop and animal prices. The farmers also consider the prices of the inputs such as fertilizers, seeds and machinery and the corresponding market prices for the produce in deciding what to plant and how much. The combination of activities in small-holder farming is not only a function of the farm household demand for food, fiber, fuel and other needs that the farm can meet, but also the culture and the socio-political state of the society concerned. Changes in the socio-political setting can be decisive for the organization of the farm system (Robison, 1983).

Farming activities are also influenced by particular climatic conditions, soils and price relations; which at times are best suited to only one or a few crops. The labour demands further determine the type of agricultural system that a farmer would employ. The various crops and livestock activities differ in time and nature of their requirements of labour, machines, buildings and irrigation facilities. The return to these inputs is usually higher on a farm with several activities instead of only one or two (Robison, 1983).

Diversification in agricultural production is beneficial to farms because households and stock-food needs are 'seasonal' and most crops grow in certain seasons only. Thus, household members and livestock are assured of the food that they may require and this is achieved more easily by growing several crops that mature at different times. Thus, diversified farming reduces risk. The activities of a farm system may also affect the environment, especially the chemicals that are being used and also the materials that the farm may source from the environment. However, the impact of a single farm may not be substantial (Robison, 1983).

2.2.3 Food Security

Food security has been defined in its most basic form as access by all people at all times to food needed for a healthy life. At the household level, food security has been defined as a state in which households have continuous access to food supplies which can fully satisfy the nutritional and dietary needs of all its members at all times. Such a situation implies that a household has the capacity to produce adequate food supplies on a stable basis and in a sustainable manner. Thus, a state of household food security satisfies three essential conditions: capacity to procure adequate food supplies, their stability, and their sustainability (WHO/FAO, 1993).

Food security may be a national problem whereby all or most of the population does not get basic food needs. Food security may be also a household problem when the family does not have access to sufficient food due to general or localized factors. On the other hand, it may be a chronic problem when people are always underfed. In many cases, however, transitory food security problems are experienced due to a temporary decline in household access to sufficient food, as well as physical, biological or political issues. Food insecurity has been viewed as a situation where not all can have a fair share of the food available or produced. Food insecurity can be attributed to many factors, including decline in agriculture productivity, climatic changes, inefficient food distribution systems, HIV/AIDS and the management of land use (FAO/WHO, 1992).

FAO (1997) has defined the objective of food security as assuring to all human beings the physical and economic access to the basic foods they need. This definition implies three different aspects of food security, namely, availability, stability and access. The definition of household food security accepted by the Committee on World Food Security (1998:1) refines this definition. The Committee defines household food security as the physical and economic access

to adequate food for all household members without undue risk of losing such access. This definition introduces the concept of vulnerability.

Thus, the definition of food security is said to include the following checklist:

1. Economic and physical access to food.
2. Food self-sufficiency (described as food for a healthy and active life).
3. Security of access, which requires political and economic stability, and,
4. Sustained access over a long period of time.

Food insecurity therefore exists when one or more of these conditions is absent (Moseley and Logan, 2005:134).

There are two interacting parts of food security policy and research agendas in the area of research. One is food availability through domestic production, storage and/or trade and, two, access to food through home production, the market or food transfers (Rukuni and Eicher, 1987:9). The nature of food access depends on the particular conditions prevalent in a given farming system. Food may be derived from home production, or through purchase, gathering (such as fishing), through barter arrangements, gifts or some other means of transfer (FAO, 1995).

The stability of household food supplies refers to the ability of a household to obtain food supplies on a continuing basis, including 'stress' or shocks brought about by crop failures, market price fluctuations or loss of employment. Sustainability implies that a household is able to minimize the extent and duration of food deficits and be able to bounce back and quickly regain adequate supplies in case of a short fall. Such resilience is possible where a household has buffer mechanisms to absorb the effects of short-term production or income deficits (FAO/WHO, 1992).

As such, households lacking access to buffer mechanisms of some kind tend to be fragile and highly vulnerable to food supply deficits. These buffer mechanisms assure the farming households of sustainable access in case of shortfalls. Among the food insecure socio-economic groups are low-income smallholder farmers, who have limited access to land, financial resources and farm inputs. Many times, a change in rainfall patterns may bring about total or partial crop failure. followed by localized or countrywide food shortages as witnessed in Kenya and several other African countries in recent years (Kigutha, 1995).

In communities marked by landholding and income inequalities, household responses to food shortages occur differently along the lines of wealth and access to resources. Identical climatic conditions can affect households of varied economic levels to different degrees. For example, seasonal shortages in food availability may have limited effect for some families, while in others they might produce famine conditions. Poor households, especially those with smaller landholdings and a weaker resource base, are more vulnerable to food stress than wealthier households and begin to suffer earlier than the rest when food shortages occur (FAO, 1986).

The rural poor have traditionally relied upon agricultural-based savings in terms of food stocks. When these rural households deplete their stocks long before the next harvest, they engage in wage labour which, especially in the rural areas, is usually scarce and seasonally influenced. In areas where farming households produce crops once a year, on-farm wage labour may be available for very brief periods within the annual crop production cycle, especially during the wet season, a time when every household is faced with labour shortage given that everyone is busy (Kigutha, 1995).

Two types of food insecurity have been identified: chronic and transitory. Chronic food insecurity results from inadequate dietary intake arising from the continual inability of

households access to needed food, either through production or market purchase. Transitory food insecurity, on the other hand, is a temporary decline in a household's access to needed food, due to instability in production, food prices or incomes. Mostly, it is the chronically food insecure and/or the poor households who are hit hardest by transitory food insecurity (FAO/WHO, 1992).

A critical factor in household food security is the difference in food prices between farm-gate prices and the implication that the difference may have on how much food farming household's have/keep. In areas with a high proportion of food-poor households, where subsistence farming is the primary source of livelihood, the selling of produce immediately after harvest when prices are low is necessary. However, the sale price has always disadvantaged the farmer, who sells the staples only to buy them again at higher prices (Kenya and UNICEF, 1998).

2.2.4 Kenya's food policy

After the shortage of maize and the famine of 1980, the government came up with Sessional Paper Number 4 of 1981 on National Food Policy (Kenya, 1981a). Top on the priority was the task of ensuring that there was increased domestic food production, which could lead leading to self-sufficiency. The government's aim was to ensure that people do not go hungry. The main issues that were identified as important in increasing domestic food production were the support of farmers by ensuring that they had access to lower fuel prices, agricultural implements such as tractors and their spare parts, and fertilizers. The challenge for the government was to translate this desire/policy into tangible results and how to handle the issue of idle land, which could be put into productive use (Kenya, 1981b).

In 1994, the government came up with Sessional Paper Number 2 on National Food Policy, which was a revision of Sessional Paper Number 4. Failure by developing countries to feed their populations made these developing countries vulnerable to conditions set by the

lenders. Although the 1994 Sessional Paper put emphasis on increased domestic production, it identified challenges that the farmers were facing such as inadequate support from the government. The government had done little to help improve agriculture. For example, when the country did not produce enough food, the government was quick to import, yet it was not as swift in allocating enough money to help improve farming. When Sessional Paper Number 4 was presented to parliament, the legislators argued that importing food meant that the country was supporting farmers from those countries from which the agricultural products were being imported (Kenya, 1981b).

To help in agricultural production, programmes such as the establishment of livestock clinics, and building of cattle dips to help tackle livestock diseases were proposed. Additional measures were the lowering of the cost of artificial insemination, ways of preserving milk in such forms such as powder, provision of slaughter houses in areas where livestock is bred and establishment of farmers' banks, which were responsive to farmers' needs and could lend money to them at lower rates so that locally produced goods were competitive (Kenya, 1981b).

The legislators pin-pointed issues on land use policy, in that some households were cultivating land which was initially meant for ranching, and that this would eventually affect food security. The question of how to put unutilized high potential land to productive agriculture and livestock development were also highlighted. Punitive measures such as imposing high taxes on idle land were proposed. Further, the government highlighted the need to shift to non-dependence on rain-fed agriculture. It was realized that some of the famines could have been avoided and/or their impacts significantly reduced. Such famines include those brought about by drought, floods, rapid deforestation, farming practices that do not hinge on environmental

sustainability, and rampant destruction of rainfall areas especially for human settlements, timber or charcoal burning (Kenya, 1981b).

The need to provide farmers with stores, where they could sell their produce especially during bumper harvests, would help these farmers get incomes and also pass the cost of storing the excess food to the government. Further, when these farmers ran out of food, they could buy from government stores at fair prices. However, the lack of guarantee for markets (such as government stores) and low prices for produce has made farmers lack incentives to invest in productivity increasing practices. When the government does not subsidize the inputs needed by farmers to produce maize and then offers to buy agricultural produce such as maize, wheat and rice from farmers at prices that cannot cover the cost of production, many households stop large-scale production to avoid making losses (Kenya, 1981b).

The proposal for direct intervention such as food aid when there is food shortage is not sustainable because the food rations given are too small for the affected household to rely on it. Kenya has not been able to produce enough of her food needs and as a way of meeting the food deficiency has increasingly depended on food import/aid, which contradicts her policy of self-sufficiency. Poor logistics on the free movement of food within the country, so that there would not be famine in the midst of plenty has been identified in the Sessional Paper Number 4 of 1981. Further, it was recognized that placing food in the hands of middlemen, who would charge exorbitant prices would make the poor lack access. However, this has not been realized because millers and other private handlers are still importing large amounts of grain and determine the market prices of basic food commodities, a situation that puts the poor households at risk of starvation (Kenya, 1981b).

Control of food exports especially when the country does not have enough food was another strategy identified in this debate on the Sessional Paper Number 4 of 1981 by the

legislators (Kenya, 1981b). Monitoring and early warning systems were put in place. However, there seems to be an assumption that these early warning systems are for the farmers. The government does not seem to take precautionary measures to cushion the country from food shortages, other than importing food. In cases where farmers get to know about this warning, they may not have an alternative course of action due to lack of other economic activities besides farming the crops that they are used to.

The prioritization of maize as the main crop that determines whether the country and households at large are food secure seems to ignore the fact that nutritional balance requires the intake of other foods that are rich in proteins and vitamins. Other grains such as beans and other cheaper sources such as fish farming are yet to be given similar attention as maize production. The need to integrate the agricultural policy with other policies such as those touching on energy would have helped farmers irrigate their fields (Kenya, 1981b). However, the slow pace of rural electrification, high costs of electricity and lack of agricultural knowledge and exposure to better farming practices have not made much impact. According to Kenya (2002), government policies with respect to agriculture and rural development have suffered lack of common objectives and coordination among the implementing ministries. To achieve the dream of national self-sufficiency, the country will need support from political and policy leaders, as well as the benefit of agricultural literacy, which can be achieved by exposing farmers to best practices (Kenya, 2002).

2.2.5 Determinants of agricultural production and food availability

In the rural economies of Southern Africa, a people's strategy for gaining livelihood characteristically depends on combining crop production, stock raising, and off-farm employment, including wage labour. Strategies vary both within and between countries, and

productive activities exist in different combinations. It is becoming very clear that the patterns of diversified income strategies in Southern Africa are dependent on inter-household linkages and intra-household strategies. Access to draught power and male labour are the key constraints facing on-time plough planting, which is essential in a harsh, unpredictable natural environment. Access to draught power is affected by the unequal distribution of cattle holding and income, while the availability of male labour is affected by the high rates of male migration. Inter-household linkages are crucial to assuring access to both types of resources. At the same time, female labour is a significant factor in the household's successful income strategies (Peters, 1986).

To understand the significance of this production mix for family livelihood and for agricultural research and policy, other factors have to be considered. First, is the state of arable production. The second factor to be considered is wage labour or off-farm employment. This implies that for farming households to be food secure, there is a need for them to have some income to cater for their needs. Alternatively, a good marketing system of these farm products is needed so that farmers do not sell their products at throw-away prices However, food sales and purchases appear to be increasing in rural Africa. (Peters, 1986).

The key to increased agricultural production is first, the availability of embodied skills secured through appropriate use of agricultural inputs, objective decision-making on markets and prices, prudent use of appropriate, scientifically, and environmentally friendly agricultural management practices, efficient use and conservation of agricultural resources including soil and water, and the disposal of outputs (agricultural products) are all contingent upon the fulfillment of the two conditions above. In Kenya, the fulfillment of condition one, that is, availability of embodied skills is still inadequate especially with regard to women (Ayot, 1995:41).

Parallel to training is the notion of 'agricultural literacy' which provides for the enlightenment of the agricultural population either through actual training or community mobilization campaigns and extension services. Apart from disseminating relevant information of new developments in the sector, training can also serve as an avenue for popularizing new techniques of production and the adoption of appropriate technologies. Women are practical agriculturalists who should be specifically targeted for extension training. Also, women beneficiaries of agricultural development projects should be trained in the basic principles of use and management of new and appropriate techniques of agricultural production including the maintenance of installed agricultural technologies and infrastructure. This would bring about, as should be, sustained women-led rural agricultural development (Ayot, 1995:42).

Factors associated with production at the household level include social and legal norms, which dictate land ownership and access to productive services. For instance, women have fewer rights to land and limited access to extension services and credit. Labour is a major limitation, as farming is still reliant on family labour. The migration of men to urban areas in search of jobs leaves children and women with additional responsibility of food production. This has contributed to lower levels of productivity and food production, especially among small-scale producers. Heavy storage losses are one of the reasons why farmers sell their produce immediately after harvest (Kenya and UNICEF, 1998).

Throughout Africa, women are responsive to, and are critically concerned with the means, which provisions the family. As on-farm researchers conduct surveys and establish trials in Eastern and Southern Africa, they increasingly find themselves dealing with women farmers. At farmers' group meetings, women invariably outnumber men; in fact, 50 per cent of all farmers in Africa are women (Low, 1986). Because women everywhere are responsible for household

production activities (household maintenance and childcare), it follows that much of the agricultural work in Africa competes with household production activities for the allocation of women's time. This concern is important because labour is a significant component of agricultural production.

Little land is allocated for subsistence farming and no encouragement is offered by way of technical support, credit or land rights to women who comprise the bulk of subsistence farming. Access to water resources that directly affect household food security for food production and processing is also hindered by lack of entitlement. The most at risk in food insecurity are the poor, the landless, and the unemployed, among whom women are the highest (Low, 1986).

According to a report by the World Bank (1995), a majority of the poor in rural areas are food and subsistence farmers and those who derive the bulk of their income from the informal sector. About a third of rural households are female-headed, and two-thirds of them have no male support. They are headed by widowed, divorced, or separated women with children. The incidence of severe poverty is significantly higher among such households, 44 per cent compared to 20 per cent for male-headed households. A major cause of poverty among divorced and separated women is the loss of access to land. Such women often flee to urban areas where they remain poor (World Bank, 1995:1).

The role rural women actually play differs greatly today from their traditional roles a decade or more ago (Saito and Spurling, 1992). A number of related forces have brought about these changes, including the following: First, the high population growth and the pressure it brings to bear on land in many parts of the developing world has resulted in smaller land holdings that are less viable for family support. The worsening rural poverty that results has

tended to force women into field activities, and men into migrating into the cities, mines and plantations in search of paid employment. On smaller landholdings, women are more likely to farm and men to have off-farm employment because of the unequal division of labour and low levels of mechanization. On the other hand, on larger holdings, men are more likely to undertake field activities due to highly mechanized systems of production. Other related forces are the male migration in search of better income generating opportunities, and the increasing incidence of AIDS in certain regions, which are contributing to an increase in the dependency ratio and also a higher proportion of women in rural areas. Agriculture is thus increasingly 'feminized' as farms are managed or run on a daily basis by women who are more common ((Saito and Spurling, 1992).

The sources of risk to food security can be from natural risks, for example, climatic shocks such as drought or disease and pests. Thus, some parts of the environment that determine what the farming system will be are outside the control of the individual farming family, thereby causing uncertainty as far as the farmer is concerned (Norman *et al.*, 1998). Risks can also come from changes in state institutions and policies, removal of subsidy programmes, imposition of taxes, changes in property rights, and challenges in market conditions, all of which can affect the prices of vulnerable faces. These vulnerable groups are the unskilled landless, subsistence farmers who have deficit in food production or the low farmers who either plant cash crops or food crops, pastoralists and remote area dwellers (Thomson and Metz, 1997).

Market conditions affect accessibility to food. In the past, the Kenya government used to control consumer prices of foodstuffs or subsidize them at all levels, and sought to cover domestic producer prices, costs of processing, and distribution. However, in the 1990s the government reacted to a liberalized environment and stopped subsidizing foods. This led to a

subsequent increase in prices of basic foodstuffs and created adverse conditions for the vulnerable groups. Under these circumstances, it is almost true that women adjust their lives to bear the brunt of the burden. They work extra hours just to keep the family afloat and eat least to make sure that the rest of the family is fed. These invisible adjustments jeopardize women's health as well as that of their children. For the poverty-stricken female-headed households, sudden hikes in food prices can make the difference between subsistence and starvation. Changes in community rights and obligations can also create risk, particularly for the most vulnerable (Royal Netherlands Embassy, 1994).

The primary obstacle to farmers' achieving timely ploughing is their difficulty in gaining access to draught animals. Households at the end of the queue to draught power are likely to be kept there not only by the conditions of production but also by labour supply factors. Many exchanges for the draught power involve the offer of household members' labour in exchange for the use of draught. As a result, cattleless farming households run the risk of not only failing to acquire draught animals early enough to plant at the 'best' times but also of having to provide labour during the crop cycle on the lender's fields at the expense of their own fields. Draught power is of importance to many rural farming households because it is the machinery that many can afford when planting. Poorer households may be unable to break out of a cycle of low output and income because, to borrow draught, they are forced to spend less time on their fields than they would wish or than is necessary. In addition, the unpredictability of the rainfall patterns makes the timing of plough planting absolutely critical (Peters, 1986).

In other less unfortunate cases, the absence of household members may lead to a situation where cattle receive insufficient care, the dwindling herd is a drain rather than a help and cash remittances must be spent to purchase food because of insufficient crop production (Peters,

1986). Finally, conflict and the breakdown of the rule of law can cause chaos, which may tumble many households that were thought to be food secure, into extreme vulnerability. Some risks are more likely to occur than are others. Much depends on the extent of climatic variation in a country, the stability of the state and of the community institutions, as well as the extent of involvement in the market, particularly those markets which have historically been subject to major fluctuations (Thomson and Metz, 1997).

The structure and institutions of society affect the farming system in three ways: first, they create pressures that require particular individuals to produce more than they need for subsistence; second, through marriage customs and group insurance systems, they cause the disposal and investment of accumulated wealth in ways that may or may not benefit agriculture; and, third, they create differential access to important resources, including land and labour (Vierich, 1986).

The 'total' environment in which farming households operate consists of two parts: The technical (that is, natural or physical) and the human element (Norman *et al.*, 1988). The technical element determines the types of, and physical potential of livestock and crop enterprises. For example, in some areas, the low level of rainfall allows sorghum, but not maize to be grown on rain-fed land. The technical element includes physical and biological factors. These are often modified to some extent through technology developments, for example, increasing water availability through irrigation, improving soil quality by adding fertilizer, and breeding for yield stability during drought. The human element is important in determining what the actual farming system will be. The human element consists of two types of factors, the exogeneous and endogeneous (Norman et al., 1988: 330). The exogeneous factors (that is, the social environment) are largely out of control of the individual farming family. These factors will

influence what the farming family can do and can be divided into three broad groups. The first group consists of community structures, norms and beliefs. The second group refers to the external institutions, which, on the input side, include extension, credit and input distribution systems, while in the output side there are markets. Other influences are population density and location (Norman *et al.*, 1988: 332).

The endogenous or internal factors, on the other hand, are those that the individual farming household controls to some degree. These include the types of inputs mentioned earlier, that is, land, labour, capital and management. It is important to recognize that these resources vary among households and regions. They vary on the basis of quantity and quality, both of which influence the performance and the potential of the system. In addition, these inputs or resources may or may not be owned by the household as discussed earlier (Norman *et al.*, 1988:330).

Access to one or more of these resources may be on another basis of use (for example, borrowing draught animals), which may limit or restrict the ease or intensity of use and thus, in turn, affect the goals and performance of the farm family. Nevertheless, the farming family decides on the farming system that will emerge. However, this system will be influenced and sometimes constrained by the technical element and exogeneous factors. Non-consideration of the human element in agricultural research has contributed to many so-called 'improved' technologies being irrelevant (Norman *et al.*, 1988: 331).

2.2.6 Impact of structural adjustment programmes on access to food by the poor

Structural adjustment programmes (SAPs) were macro-economic conditions dictated by the International Monetary Fund (IMF) and the World Bank to Third World countries so as to foster economic development in these countries. From the emergence of the African crisis in the

1970s to the 1980s, the most important function of the IMF and World Bank has been to provide loans to Third World countries faced with shortages of foreign exchange. This provision of loans offered both institutions the opportunity to prescribe policies to these countries (Todaro, 1997).

During the 1973-79 period, African countries received soft credit and other financial assistance from the IMF and World Bank to deal with the balance of payment deficits, while the World Bank offered loans for anti-poverty projects under its rural development programme. But since 1979, the Fund has offered more assistance to African countries under its standby agreement or extended fund facility, with tough preconditions. The Bank has also been shifting from its project-tied loans for poverty programmes to the provision of structural adjustment loans (Todaro, 1997:513).

The conditions that are set by these Bretton Woods Institutions dominate their new structural adjustment programmes. These pre-conditions, which are popularly associated with SAPs, include trade liberalization, anti-inflationary control of wage and wage increases, open door policy to trade and repatriation of profits, reduction on spending on social services, sale of public enterprises and lay-offs of already employed people (Todaro, 1997:515).

SAPs have been severely criticized for their complete neglect of the social and human dimensions of adjustment, because they overemphasize on macro-economic issues at the expense of the poor and other vulnerable groups in the society, mostly women. Costs of SAPs such as cutbacks in government expenditure on the social sector have weighed most heavily on the low-income population, the vast majority of whom are women. These low-income groups are poor and vulnerable, and, since they were the most dependent on these previously subsidized social services, they cannot afford these fees and user charges imposed on privatized services and facilities. As a result of the removal of food subsidies, high costs of inputs and low returns on

profits are causing food insecurity, thus affecting living standards that are already low (Nzomo, 1995:43).

The poor and food insecure are found in both urban and rural areas. The effect of these conditions on the rural household would be that those members of the household who are involved in the non-tradable sector, for example, domestic food production, would suffer losses since the emphasis is on export promotion (growing of cash crops in this case). As the rural household shifts towards cash cropping, production of food decreases and thus the chances of achieving food self-sufficiency is further diminished. This will definitely impact on rural households' consumption of food (Otieno, 1997).

Price reforms were introduced as a condition in a large proportion of countries receiving adjustment lending, particularly Africa, and official prices of food crops have risen sharply since 1983 in many African countries. The devaluation associated with adjustment in many countries has also tended to raise prices of food, particularly commodities, which are exported or imported. Since 1984, virtually all developing countries have devalued their currencies substantially, with the largest depreciation occurring in Africa (FAO, 1989).

The types of commodities that the poor produce and consume and their patterns of buying and selling are critical determinants of how they would be affected by price changes in the context of adjustment programmes. The urban poor generally buy from the market most of the food they consume. The landless usually buy a significant portion of their food requirements, as do small farmers who produce cash crops and farmers whose land holdings are too small to meet their food needs (FAO, 1989).

The poor also spend a large proportion of their incomes on food because of the high prices; food price increases do have significant adverse effects on their real incomes. Through

their effect on crop prices, adjustment programmes have a definite impact on incomes. In rural areas, incomes of the poor would tend to rise when they produce commodities for local and/or export. However, such anticipated gains may be negated by lack of agricultural support services and infrastructure, higher prices for essential non-food items such as fuel, fees and user charge when accessing basic essential services such as health and education (FAO, 1989). Treating food under market-oriented disciplines fails to take account of crucial food security objectives such as the access of poor households to food (Idris, 1999).

Devaluation, since it increases the local currency value of inputs needed by the household to grow their crops, adversely affects the rural poor for agricultural inputs such as fertilizers, pesticides and farm implements are pushed beyond their reach. The fact that the population increase is not being considered when planning for food production measures and programmes may lead to a situation when the country finds itself with no food. This will have the impact of creating a people who are struggling to put food on the table and thus have very little time to develop in other areas like educating their children as the prices of the little available food is pushed beyond their ability (Otieno, 1997).

Overall, when the prices of inputs (such as fertilizers) are high, those farmers that have borrowed loans to fund their farming activities may find it difficult to pay back. This is especially so because of the low price levels in the market at the time of harvesting. With the absence of government subsidy due to the terms imposed by these lending institutions, many times farmers make losses. Subsidies can be regarded as a form of protectionism or trade barrier by making domestic goods and services artificially competitive against imports. Further, the liberalization of markets coupled with cheaper imported goods makes locally produced goods/food products less

competitive in the market. This is because of the high costs of production for these local goods (Todaro, 1997).

In order to reduce the overall government expenditures, adjustment programmes have often required elimination of cuts in various subsidies and services. Thus, between 1980 and 1984, 60 per cent of IMF programmes required such measures. Of these, about two thirds required changes in subsidies on food, petroleum and fertilizers. Actual cuts in government expenditures have been substantial for all sectors and in all geographic regions, although there are also considerable differences among sectors on the degree of cuts (FAO, 1989).

There are both direct and indirect linkages between cuts and government expenditure and food security. Indirectly, the ability of the poor to meet their food security needs is also affected, often substantially, by cuts in other public services and government transfers (such as health and education) has increased expenditures on such essential needs entail sacrifices in food consumption (FAO, 1989). Government cuts on the number of agricultural extension staff, budgetary allocations on research activities, reduce the support that farming households could have, especially those in remote and less productive areas.

2.2.8 The impact of environmental degradation

Although degradation of the environment is a regional phenomenon, its impact is more strongly felt among the poorer segments of the rural population because the degradation of their natural resource base is significantly worsening their poverty. Poor small householders who till the land are in need of maintaining high fertility levels so as to maintain household subsistence and avoid diminishing returns. They are unable to achieve this because of lack of resources and at times know how to use locally available materials such as compost manure and ability to invest in labour-saving/productivity increasing technologies. The most affected are women

agricultural producers on overworked, degraded, shrinking, and increasing distant cultivatable land. The availability of male adult labour has decreased as a result of male outmigration to the urban centres. Because women farmers do not have access to modern, labour saving or environmentally sound farming techniques such as green houses which assure households of all year round access to food, increasingly hard and time consuming work is required on their plots to ensure that their households do not go hungry (FAO, 1998:60).

Environmental degradation has a direct impact on the household food security situation. FAO explains that where soil infertility has been drastically reduced as a result of over cropping, deforestation, overgrazing and erosion or where there is lack of fuel wood and portable water, women are often forced to change the dietary practices and standards of their families. Sometimes, this means reducing the number of hot meals per day, and substantially lowering family levels of nutrition, as some staple foods cannot be digested without prolonged cooking (FAO, 1998).

2.2.9 Factors and constraints affecting women's role in food security

Given women's crucial roles and contributions to food security, any efforts to reduce food insecurity worldwide must take into consideration the factors and constraints affecting women's ability to carry out these roles and make these contributions, with a view to removing the constraints and enhancing women's capacities.

Structural adjustment programmes and the trend towards liberalization of trade, have led to the dismantling of many of the marketing services that were previously available to farmers. As those often primarily responsible for marketing, women farmers have been most severely hit by this loss. The decline in investment in rural infrastructure, such as feeder roads that link rural areas to markets, also affects women's access to markets. In addition, lack of access to

membership in marketing cooperatives also limits women's ability to market their produce. These constraints act as a disincentive to women farmers to produce surplus food, since the difficulties in marketing it are great, if not insurmountable (FAO, 1998:65).

Additional problems by women in marketing their produce are low literacy levels, which hinder their ability to get involved in complex marketing channels. Lack of market information decreases their bargaining power and also their limited access to lucrative, more distant markets. This not only applies to selling but also when buying food. At times, women lack control over their own incomes, forcing them to hide their marketing activities (FAO, 1998).

Studies in Kenya also show that small-scale farmers usually sell a part of their output of grain and other foods that they produce even though they buy back the same commodities later. They do this for various reasons, for example, to meet cash obligations, lack of adequate storage or to pass the cost of storage to someone else (Ateng, 1986). Low-income rural households normally depend for their food purchase on small traditional markets where little direct government influence on prices exists; thus middlemen take advantage and buy their produce at throw-away prices. Selling of agricultural products at low prices leads to a massive depletion of the produce that is harvested, and households that may have had a lot of surplus food soon begin to starve.

Land tenure and land tenure relations define the way people own/and or rent land to others if they choose not to cultivate it themselves. In Kenya, one of the major constraints women face in agricultural production is their limited control of resources. They usually have access to land by virtue of their position as wives, mothers or other relation in the communities they live. Since they do not have control over land, it is rare to find women being holders of title deeds. This, in turn, limits their ability to engage in agricultural investments because of their lack of

collateral including finance. It is also a disincentive to productive agricultural activity because of the ever looming risk of loss of land in case the matrimonial relationship breaks (Ayot, 1995).

Women are the most vulnerable members of poor families as they are tied to the home (culturally or biologically), and are therefore constrained from seeking alternative means of livelihood. Land is a principal factor of production, and so access and control over land is critical to families, particularly in the rural areas where 80 per cent of the population live. Traditionally, access to land was open to all members of the family while control was vested in the clan or the community. Customary inheritance of land and other property was and still is biased against women. In land tenure reform through land registration, husbands are legally acknowledged title deed holders, although the law of succession entitles women and daughters to share in the estate. Thus, discrimination in ownership and inheritance against women remains common (Royal Netherlands Embassy, 1994).

However, Kenya's new Constitution accords both women and men rights to equal treatment, including right to equal opportunities in political, economic, cultural and social spheres (Kenya, 2010c: 25). Though this constitution abolishes discrimination against women in inheritance, for this provision to be realized, there may be need for sensitization and good-will on the part of household heads to allow their daughters to inherit on equal terms as their sons. Further, women may also need to be educated on this provision of equality in inheritance.

Since land is the productive asset, which mainly determines income distribution and thus access to food in the rural areas, it should follow that household food security among rural people is closely related to land tenure status and to the size of the land holdings. For this reason, the distribution of rural wealth and the incidence of poverty are closely connected to the socio-economic order, which determines the type of access to land and its use in society (FAO, 1986).

Due to increasing scarcity of arable land, combined with rapid population growth and strong land inheritance traditions, fragmentation of land, especially in Kenya, has reduced the size of landholdings to uneconomic sizes. In 1975, it was estimated that the number of rural households in Kenya holding less than one hectare of land was 31.8 per cent of the total rural population (FAO, 1986). It is likely that this number may have increased in recent years as a result of the rising population (Kigutha, 1995).

Patriarchy in Kenya persists in most households and at the workplace. Patriarchy is a concept of a system of political, social and economic authority in which males predominantly or indeed often monopolize the decision-making process. The subordination and control of women by African men was rooted in material basis of patriarchal power by severely limiting their access to land (Nasimiyu, 1991).

2.2.10 Conclusion

From the literature reviewed above, it is clear that household food security can be achieved through agricultural production system, which is the focus of this study. In addition, an understanding of the operational constraints facing the resource households, and the relationships that exist between members of the households as well as the society in which the farming households operate are critically important when evaluating the food situation. Concerning this, it is also important to understand the farming household members' goals and incentives, farming and non-farming activities and the resources available since they affect household food security. This implies that household food security is a function of a compound of many factors, not just how much the farmer harvests, but also what the harvest is used for.

Further, focus needs to be shifted from national food self-sufficiency as being an indicator of food security at the household level. This is because there could be 'enough' food production

to feed the entire nation, but a section of the people are facing hunger; could be because they cannot afford to buy or they have not produced enough from their farms.

For small holder rural households, the capacity to procure adequate food supplies implies the ability of such households to obtain food through own production, income and transfers, an assortment of foods for them to lead healthy and active lives, on a continuing basis. Lack of means that assure the households continuity of access leads to hunger and/or famine.

2.3 Theoretical Framework

2.3.1 Functionalism theory

This study was guided by the theory of functionalism as proposed by Bronislaw Malinowski (1939) in his writing on 'the group and the individual in functional analysis'. Malinowski explains culture as an interrelated whole, not a collection of isolated traits. He argues that culture functions to meet the needs of individuals rather than society as a whole. He reasoned that when the needs of individuals, who comprise society, are met, then the needs of society are met. To Malinowski, the feelings of people and their motives were crucial knowledge to understand the way their society functioned (Ember and Ember, 1990).

Malinowski suggested that the individuals basic needs include nutrition, reproduction, bodily comfort, safety, relaxation, movement and growth. Some aspects of culture satisfy these basic needs. In doing so, they give rise to derived needs that must also be satisfied. For example, culture traits that satisfy the basic needs for food give raise to the secondary or derived need for cooperation in food collection or production. Societies will in turn develop forms of political organization and social control that guarantees the required cooperation (Ember and Ember, 1990: 190).

A culture is composed of many different elements, such as food acquisition, family relationships, and housing. Malinowski believed that all of these elements are connected and work together for one purpose, which is to meet the needs of individuals in the culture. In other words, culture exists to satisfy the basic biological, psychological, and social needs of individuals.

For example, the first human need, metabolism, refers to 'the process of food intake, digestion, the collateral secretions, the absorption of nutritive substances, and rejection of waste matter' (Malinowski, 1944:91). Culture meets this need by possessing the following different domains on how food is grown, prepared, and consumed; where this food is consumed and in what social units. To Malinowski, the economic and social organization of the distribution of foods as well as the legal and customary rules that ensure the steady operation of food distribution are important as well as the authority that enforces those rules.

All of these domains are linked and function together to meet the basic human need, metabolism. Malinowski called this whole function commissariat, which is a cultural response to metabolism.

2.3.2 The Relevance of this theory to the study

Food acquisition is one of the activities undertaken in society to meet a need, which is adequate and nutritionally balanced for the individual's continued living. Food acquisition takes place in a social setting, and the researcher has confined herself to the household setting. In the area of study, food is acquired mainly through farming, but also a small proportion is purchased, when and if the households are able to.

The secondary (or derived) needs that have arisen out of farming in order to meet the primary need for nutrition include forms of organization in control and access to productive resources which are key to farming such as land, and the accompanying social norms on who owns or inherits this important resource. Additional social structures that affect farming include division of labour, whereby there are duties that men and women perform and that are socially determined. Todaro and Smith (2009), state that in Africa, nearly all tasks associated with subsistence food production are performed by women. They further state that women are responsible for all subsequent operations, including removing and burning felled trees, sowing or planting, weeding, harvesting and preparing the crop for storage or immediate consumption (Todaro and Smith, 2009:450).

The theory of functionalism is useful to this study because it helps to explain the role of food production in the society. By grouping the needs into primary and secondary categories, it makes it easier for the researcher to understand how resources necessary in farming are controlled and used by the households. The researcher is therefore able to pinpoint areas that may need to be addressed in order to ensure that these households become food secure.

2.3.3 Definition of terms

Farming system: The growing of one or more crops, rearing one or more species of animals, or mixing to varying degrees the production of commodities with the rearing of animals (Okigbo, 1986).

Household food security: The ability of the household to produce or buy adequate, safe and good quality food to meet the dietary requirements of all its members at all times (Kenya, 1994b). Key to household food security is not only producing enough when the conditions are

favourable, but ensuring continuous access even during periods of shortfalls in food production. The reduction of the extent of the periods when households are food insecure keeps the affected households from starvation.

Household: A basic residential unit in which activities on economic production and consumption, reproduction, inheritance and shelter are organized and carried out. Household members comprise those who are residential as well as non-residents who contribute in assuring that their respective households are food-secure and, at times, draw from the resources.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

In this chapter, the researcher describes the methodology that was used in the study. The research setting, research tools used, the sampling procedure and data analysis are discussed. The problems encountered in the field and ethical issues are also presented.

3.2 Study site

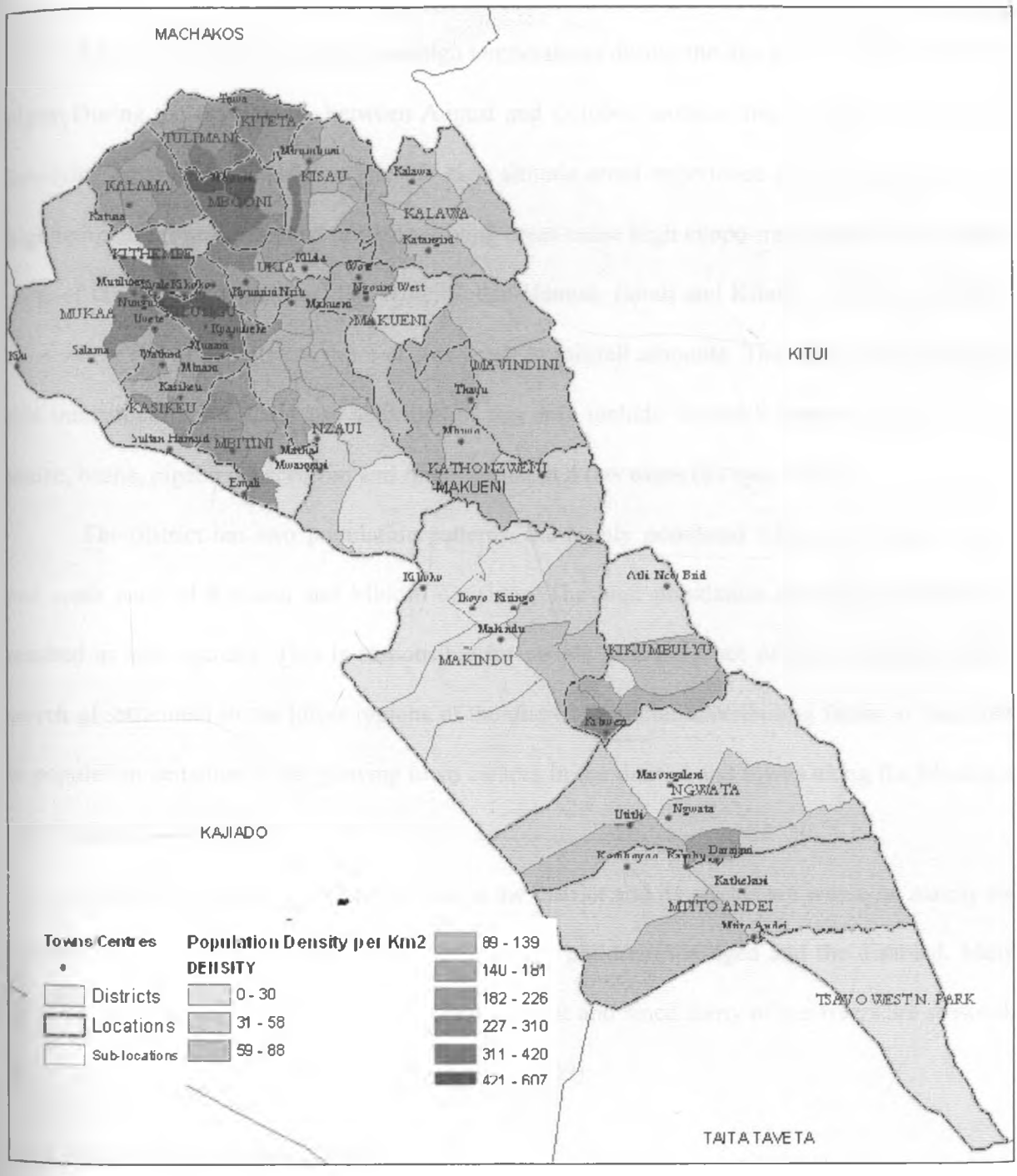
As already stated, the study was done in Kasikeu division, which is part of Makueni district (Map 3.1). Makueni district was curved from Machakos District in 1992, and is one of the thirteen districts that form Eastern province. It lies within the foreland plateau between the eastern Rift Valley and the Nyika plateau. It borders Kajiado district to the West, Taita Taveta to the South, Kitui to the East and Machakos District to the North (Map 3.2). The width of the district in some parts ranges from 100 kilometres in the North to less than 20 kilometres in the South. The district covers an area of 7,965.8km^2 and has 16 administrative divisions and Kasikeu Division covers an area of 256km^2 (Kenya, 2005a).

Makueni district rises from about 600m above sea level at Tsavo and reaches 1900m above sea level in the Kilungu hills. One of the major land features is the volcanic Chyulu hills, which are situated along the southeastern border in Kibwezi division. The district is generally low-lying and it lies within the arid and semi-arid zones. Overall, it receives scarce rainfall, which varies with altitude across the district. The average annual rainfall is slightly over 1000mm in the hills, which is received in two seasons. The short rains occur in November/December while the long rains fall in March/April. The hilly masses to the north and central parts of the

district influence climate in the surrounding areas. These are cool and wet, and receive 800mm-900mm per year, whereas the low-lying areas are hot and dry and receive 200-900mm per year and Kasikeu division falls in this area (Kenya, 1997).

Map 3.1: Location of Makueni District

Source: Owuor and Kisangau (2006).



Map 3.2: Location of Kasikeu division

Source: Kenya, Republic of (2005a)

Most of the district experiences high temperatures during the day and low temperatures at night. During the dry season, between August and October, extreme heat is experienced in the low-lying parts of the district, while the high altitude areas experience cool temperatures. The high temperatures experienced in the low-lying areas cause high evapo-transpiration. The central parts of the district, which include Wote, Sultan-Hamud, Emali and Kiboko, form a transitional zone where the dry spells are more or less equal in rainfall amounts. The study area falls under this transitional zone. Land use activities in this area include livestock keeping, cultivation of maize, beans, pigeon peas, cotton and finger-millet in a few cases (Kenya, 1997).

The district has two population patterns, the highly populated hills of Kilome division, and some parts of Kasikeu and Mbitini divisions. The high population density in the hills has resulted in land scarcity. This is responsible for people migrating out of their ancestral land in search of settlement in the lower regions of the district. Another contributing factor to variations in population densities is the growing town centres in the district and towns along the Mombasa road (Kenya, 2009).

Drought is a major cause of poverty in the district and its effects are worse on mainly the vulnerable groups in this area and they are women, children, the aged and the disabled. Many families lose their livestock during prolonged drought and since many of the rivers are seasonal, water scarcity is a common phenomenon (Kenya, 2009).

3.2.1 Population and environment

The *Kenya Population and Housing Census* of 2009 indicates that the population of Makueni District is 884,527 people (Kenya, 2010b). The district population is said to be generally youthful, with those aged below 15 years accounting for 47% of the total population.

This age group, together with those above 64 years, constitutes 51.8% of the total population, and this has created a high dependency ratio (Kenya, 2005a). A majority of the inhabitants in these rural households are Akamba.

A major concern of the district is the high rate of deforestation, inadequate water, poor sanitation and high rate of soil erosion. Additional challenges include the high rate of sand harvesting, poor waste management and poor implementation of the Environment and Natural Resources Act (Kenya, 2005a).

3.2.2 Poverty rates

Poverty is a major development challenge in the district with 73% of the total population in the district living below the poverty line. A major effect of poverty in the district is the high rate of school drop-out as parents are unable to meet the costs of education (Kenya, 2005a). The literacy rates for males is 79.6% and for the females 70.5%, and the bulk of the labour force is either unskilled or semi-skilled and is mainly engaged in agricultural activities (Kenya, 2009).

The poor are said to be vulnerable to nutrition-related illnesses and respiratory infections due to poor shelter (Kenya, 2005a). Those classified as poor in the district experience both absolute poverty and also lack food. The causes of poverty are unreliable, inadequate and erratic rainfall, lack of clean drinking water, which has led to increased cases of waterborne diseases (such as typhoid, amoeba and dysentery), reduced productivity, and increased cost of medication (Kenya, 2009).

Unemployment in the district has led the youthful productive population to migrate to urban centres, leaving the less able and aged in the villages. Poor marketing systems of the agricultural produce, poorly developed road network, lack of rural electrification to steer and bolster rural micro-industries such as Jua Kali has led to low incomes and low-levels of

employment. The road network in the district mainly consists of gravel and earth and these roads are often rendered impassable during rainy seasons (Kenya, 2009).

3.2.3 Distribution of health facilities

There are 138 health centres in the district, though these are inadequate given the vastness of the district. Thus, the district continues to experience difficulties in providing efficient health services for the fast growing population because it needs heavy investments to be able to upgrade, modernize and construct new health facilities (Kenya, 2005a). The average walking distance to a health facility for 87.3% of the population in the district is beyond five kilometres (Kenya, 2009).

The main health issues that the households in the division face are low immunization coverage, high morbidity and mortality among young children, and the high rate of HIV/AIDS infection, which is common among the youth (Kenya, 2005a).

3.2.4 Education facilities

There are 1,039 pre-primary, 841 primary and 134 secondary schools in the district. There is only one technical training institute at the tertiary level (Kenya, 2002).

3.2.5 Nutrition

The households in the district access food through crop and livestock farming, with the main aim being producing enough food to feed on as well as to sell. The major crops grown include maize, beans and cowpeas; while the main livestock kept include poultry, goats, cattle and, to a smaller extend, sheep. It is estimated that over 60% of the population in the district depend on these agricultural-related activities for their livelihood (Kenya, 2009). The main maize varieties grown include the Katumani and Makueni Composite varieties (which are early

maturing) and local varieties. In some cases, households plant both the improved and local varieties. The people claim that the local variety gives better yields during good rains than the Katumani Composites (Kenya, 1987). The district has a high rate of malnutrition, an occurrence that is caused by the limited variety of crops that are grown in the district (Kenya, 2005a).

Previously, grains such as sorghum, maize and the various types of millet, were pounded with a mortar and pestle to make various types of porridge such as *usuu wa wimbi, usuu wa mwee, usuu wa makindi and usuu wa ikii.* Flour from millet, sorghum and maize grains were mixed into a thick composition similar to *ugali* and served with milk or butter or eaten dry (Kenya, 1987).

During difficult times, livestock would be slaughtered from the jugular vein and even animals that died as a result of drought were eaten. Children were given some milk to drink, especially sour milk. Butter was obtained from the milk and was mixed with various types of food (Kenya, 1987).

3.2.6 Land tenure and inheritance in land: The origin of rights in land

The Akamba call land to which no individual or family has acquired specific rights *weu.* In a legal sense, it normally signifies grazing land which may be used from time to time by any individual and to which no one has established an exclusive claim. From this *weu*, individual Akamba have taken up holdings until there is now none left (Penwill, 1986).

Only sons inherit land and a father does not divide up his land before his death. The clan elders help these sons to divide the land and all sons share equally in the inheritance of their father's land, save for the eldest – and the eldest son of each wife where there are several wives- who receives slightly more than the normal share as a tribute to his position as the head of his particular branch of the family (Penwill, 1986).

3.3 Study design

This study was descriptive in nature. Descriptive studies are concerned with describing the characteristics of a particular individual or a group (Kothari, 2004:37). The study collected both qualitative and quantitative data. Quantitative data were collected through a structured questionnaire with both open-ended and closed-ended questions. Key informant interviews, focus group discussions and direct observation were used to collect qualitative data.

Quantitative data were analyzed using the Statistical Package for Social Sciences (SPSS) computer software and findings presented in tables of frequencies and percentages as well as pie-charts. Qualitative methods were used to analyze data obtained from focus group discussions, direct observations and key informant interviews. These were organized and summarized according to emerging themes and presented in verbatim quotes and selected comments.

3.4 Universe and unit of analysis

The study population consisted of rural households that practise farming in Kasikeu division. According to Kenya (1999), Kasikeu division had at the time an estimated 6,852 rural households that grow food and cash crops.

The unit of analysis was the household and the head in that household was the respondent. This study took the household as the basic unit of analysis to better understand the relationship between farming systems and food security, since the household is the smallest unit which is concerned with production and consumption, and it is also the place where most people access food. Further, other activities related to farming such as division of labour, land use and inheritance are organized and carried out within the household.

In cases where household heads were not available, for instance, in the case of a male household head being away, the wife or any adult present was interviewed. By interviewing the

household head, the study attempted to capture data on the decision-making process in crop and animal production such as what to plant, where, how, who owns and inherits land and also the agricultural technology used. This is because resource ownership, control and allocation, including division of labour and implements used in farming, are key factors which were looked at in the study.

3.5 Sample size and sample selection

The study employed both probability and non-probability sampling methods to obtain its study sample. A sample size of 100 households was randomly selected from the study population and interviewed. The researcher used cluster (area) and systematic sampling methods. Area sampling was used for this study because the study area is divided into three geographical regions/groups with no overlapping boundaries. These groups are the three administrative locations that make up Kasikeu Division.

These three locations are Kasikeu, which has a household population of 2896, Kiou with a household population of 2938 and Mumela location, with a household population of 1018 households (Kenya, 1999). The actual inclusion of the sample was further determined by systematic sampling in the field, whereby every 5^{th} household in the selected villages was interviewed. In Kasikeu and Kiou locations, two villages were selected for study, based on their topographic features, that is, the type of soil and landscape features. Thus, in Kiou Location, the researcher covered one village with red/loam soil which is low lying and favourable for crop production, and another village with clay/rocky soils and is hilly. In Kasikeu Location, the researcher covered one section of the region that has sandy soils and another village with a mix of clay and loam soils and is hilly. Mumela Location has generally sandy soil and is fairly hilly

and one village was covered. Using area sampling, subjects were selected in a way that existing sub-groups in the population were more or less reproduced in the sample.

In determining the distribution of the sample, unequal probability selection was applied. That is, a location with a higher household population was given a higher proportion of the sample. Both Kasikeu and Kiou locations contributed 40% each while Mumela location contributed 20% of the total sample size. As stated earlier, the total survey sample was 100 households. This sample was found to be sufficiently large enough to enable the researcher draw conclusions based on the study objectives.

3.6 Methods of data collection

3.6.1 Structured interviews

A structured questionnaire (Appendix 1) was administered to 100 household heads to collect quantitative data. The questionnaire contained both open-ended and closed-ended questions which were identical and structured in a systematic manner. This method of data collection involved exposing every informant in the sample to the same stimuli, which in this case was the questionnaire.

The questionnaire was used to generate information on farming systems employed by the households in Kasikeu Division. The specific information sought included finding out how the crops produced and animals kept, constrains faced when farming and selling agricultural produce as well as patterns on land ownership affect household food security in the study area.

3.6.2 Focus group discussions

Focus group discussions (FGDs) employed a focus group discussion guide (Appendix 2) to collect data on the impact that the types of livestock kept and the crops planted have on the

household's ability to access sufficient food throughout the year, constraints faced and how they cope with them, as well as the how the patterns of land ownership and use affect household's ability to be food secure.

The focus group discussions were held to verify and confirm findings already gathered from individual interviews. Five focus group discussions were held with ten members of either gender participating in each group. The discussants provided information on their farming experiences. The participants were selected purposively; those who participated in the structured interviews were not included.

3.6.3 Key informant interviews

Key informants were subjected to a key informant interview guide (Appendix 3). This involved face-to-face interviews with people who are knowledgeable on issues that were relevant to the study. Ten key informants were interviewed and these included trained personnel in agriculture (crop and livestock sectors) working in the division, professionals and opinion leaders.

The researcher used convenient sampling when selecting the key informants because they were available and they provided in-depth qualitative data which were used in expounding the issues in the data collected using the other methods.

3.6.4 Direct observation

This method was used to collect data on farming implements, types of soils, distribution of relief food and prizes of maize as shown in the observation check-list (Appendix 4). Such information aided the researcher in confirming the consistency of the results.

3.7 Data processing and data analysis

Quantitative data from the questionnaires were coded and then entered into the computer and analyzed using the Statistical Package for Social Sciences (SPSS) computer programme, in order to generate frequencies and percentages. The coding was rechecked many times to ensure that no mistakes were done.

Qualitative data collected through focus group discussions, key informants and observation methods were analyzed according to emerging themes, based on the study objectives. The qualitative data were summarized in a narrative form and key quotations from the data using respondent's own words are presented. This helped to illustrate the main ideas and give a detailed picture of the respondents' views.

3.8 Problems encountered and their solutions

Problems that arose in the field and which threatened the process of data collection are, one, some of the key informants such as the agricultural extension officers were not easily available and this led to the postponing of appointments. During the field work, planting, weeding and harvesting activities were taking place consecutively, since this was the season for the short rains. There were problems because most farmers were busy in their farms. However, the researcher made appointments with the respondents at their convenient time, and at times had to collect data in the afternoon when the respondents were back home from their farms. In some cases, the researcher interviewed the respondents from their farms. This, however, prolonged the period of the study.

The other challenge was that the farmers thought that the researcher was an agricultural officer. At times, they sought advice on what and how to plant, and even the pesticides to use.

The researcher explained to them that though she sought information on agriculture, she was not an agricultural officer and directed them where they could get such help.

The researcher also had problems accessing some parts of the study area because they were hilly and there was limited public transport to such regions. Sometimes weather conditions were not very favourable especially when it was raining. However, the researcher hired an assistant to accompany her to the far sections of the division.

3.9 Ethical Considerations

Before embarking on data collection, the researcher sought clearance from the Ministry of Higher Education, Science and Technology. Further, before starting the interviews, the researcher asked for permission from the respondents and assured them of confidentiality. When writing the report, the researcher did not reveal the true identities of the respondents in order to protect their privacy and anonymity.

CHAPTER FOUR

FARMING SYSTEMS AND HOUSEHOLD FOOD SECURITY IN KASIKEU

4.1 Introduction

This chapter presents the study findings in line with the objectives of the study. The objectives that guided the study were, one, to investigate how farming systems found in the area of study affect household food security. The second objective was to examine the extent to which the constraints faced by these households impinge on household food security and, third, to describe how patterns of land ownership and use affect household food security in the division.

4.2 Farming systems

The findings indicate that 89% of the respondents acquire their food mostly through farming only, compared to 11% who normally acquire their food through farm production as well as purchasing. Those households that said that they purchase additional food cited small farm sizes as well as poor soils which are either sandy or rocky as the cause why they do not produce sufficient food. The type of farming practised in Kasikeu division is dry land farming, whereby households depend on rain-fed agriculture. A few households with pieces of land near rivers do agricultural production on 'wetlands' in riverbeds, although this water is impounded without artificial irrigation. This kind of farming is not consistent across Kasikeu division because it is only a small percentage of the households which own land near rivers, and the rivers are seasonal.

In addition, those farms near river beds are sandy. Due to continued lack of rain, such households sell sand to middlemen who sell it to the urban areas where it is used in the building industry. Though this is against the environment and natural resources law, these households

have resorted to this for lack of an alternative source of income. This has led to severe soil erosion. deep galleys and the prospect of such households of ever being food-secure has been diminished further. Further, in these areas where sand has been sold, the rivers cannot hold water even for a few weeks after it rains due to lack of sufficient sand cover. When it rains, all the water drains and what is left behind is mostly the exposed bed rock.

Looked at from the implements used for cultivation, the farming system done in the division can be said to fall under the three main divisions, which are hoe or spade farming, farming with ploughs/animal traction and farming using tractors. Hoes are normally used for weeding beans and at times for maize and in situations where households have mixed cropping.

Data from interview schedules indicate that animal traction is used in planting by most of the households in the division. Animals are preferred to tractors because of the rising costs of fuel and because of the convenience of the oxen, in that the farming household can use the animals whenever the need arises, regardless of whether they have money or not. However, these households sometimes face problems, especially when planting. This is because of the climatic cycles whereby many times there is a dry spell before the rains come, unless it rains continuously in between the long and the short seasons, an occurrence that is becoming rare. When rain comes after a long dry spell, the oxen to be used when planting are normally emaciated and it takes a while for them to get strength since they need to feed on the grass that grows after the rains come. Table 4.1 below shows the sources of labour when planting, which is an indication of the state of agricultural technology that is available and used in Kasikeu Division.

Table 4.1: Sources of labour during planting

Sources	Frequency	Percentage
Draught power	80	80
Hoes	11	11
Both draught and tractors	5	5
Mechanized power (tractors)	4	4
Total	**100**	**100**

4.2.1 Crops planted

The main crops grown in Kasikeu division are maize, beans, cowpeas and pigeon peas. Green-grams, sorghum and finger millet are also grown, though only on a limited scale. The crops not grown on a large scale are avoided by most households because of their high demand for labour, given that the children who previously used to be relied on to help their parents are no longer available because of schoolwork.

The staple food in the area of study is maize mixed with various types of beans and cowpeas (*nzuu, nzavi* and *mbumbu).* Other types of foods available include finger-millet and sorghum, though only a few households plant them. The availability of some foods such as arrowroots, bananas and yams depends on the locality, in that households near riverbeds do plant them when water levels are high. These crops are also planted in hilly places which are cold and wet. Green maize (*mukeu*) or dried maize makes *isyo*, or if it is pounded (dry maize only) to remove the coating, it becomes *muthokoi*, which is still a favourite diet of many families.

Cowpeas are planted not only for their grains but also for their leaves, which are used as vegetables in those households that do not live near rivers and/or are unable to buy other

vegetables such as *sukuma wiki* (kale) and cabbages. The availability of cowpeas depends on the season, in that when it is dry they are not available. The vegetables that are sold during the dry spell are normally brought from other provinces where they are in plenty.

Finger-millet is normally used as children's food, since it is used to make porridge. Households in the division cited high labour demands and low market prices as the main disincentives to planting millet and sorghum. In addition, these crops are prone to bird attacks and when there is no one at home to scare the birds away, their yields drop. Lack of cash crops in the division has led to high preference for maize since this crop is useful as the chief source of food as well as an income earner. The demand for maize in the market is higher compared to that of sorghum and millet. Normally, households plant sorghum and millet for feeding their poultry.

Dietary changes have significantly reduced the demand for sorghum and millets as sources of food. There is a higher intake of tea for breakfast, which has replaced porridge. Small children and those who are unwell normally take porridge.

The main fruits produced in the division are mangoes, which yield once in a year. In their peak period, their prices reduce significantly such that households sell them at throw-away prices. This is partly due to lack of local markets since almost every household has a mango tree. In addition, the households have no means of preserving them. Since the households do not have means to transport their produce to places where they would fetch better prices, they sell them off to middlemen who take them to those regions that do not produce such fruits. At times, the fruits are taken to urban centres, where they fetch better prices.

4.2.2 Livestock production

The livestock kept include cattle, sheep, goats and chicken. Oxen are mostly kept to provide draught power for planting, weeding, transporting of harvests from the farms and for

drawing water from the water points. A few households keep traditional cows for milk but these produce little milk. Some of this milk is consumed by the households and the rest sold in shops, supplied to institutions such as schools and hotels, and also bought by those households that do not have cows producing milk. There is no organized marketing system in the division and milk prices are subject to the forces of demand and supply.

Many of these households do not keep dairy cows and high yielding beef cattle due to lack of pasture/feed and water, which are due to inconsistent rainfall patterns. Lack of big grazing fields and water for irrigation also lead to lack of adequate pasture and sometimes the area experiences very high temperatures. Further, the need for constant veterinary care and the accompanying costs of such veterinary visits and medicine is quite high given the scarce income that most of the households have. Veterinary doctors are not easily available in the division because they are only two from the Ministry of Livestock and the fees charged by those that in private practice cannot be afforded by many of these households.

The few households that keep dairy animals normally have bigger grazing land and/or are able to buy feed for them when drought comes and are able to pay the veterinary doctors and buy clean drinking water for these animals, especially when it starts getting dry. Alternatively, these cows are taken to ranches outside the division that have feed, though the owner must pay for it. A few households have grazing land elsewhere and when weather conditions become extremely dry, they shift their cattle to such places, until the rains come.

Sheep, goats and chicken are kept mostly as a form of 'security', in that they can be sold in cases of emergencies. In addition to being sold, chicken is mostly kept for home consumption, though not eaten at consistent intervals. Many households prefer to keep the traditional varieties because they do not cost much. This is because they are fed on grains and the households do not

buy feed for them. In the division, there is no organized marketing system for livestock and therefore their market prices depend on their demand and supply and, more so, on the season.

During drought, the livestock are fed on the stock that households keep after harvesting. Once this source is exhausted, such animals are fed on banana stems, if the households have bananas. Those households without any other option buy grass bundles from the ranches if they have an income. Those without normally sell off their cattle to prevent them from starving to death and to buy food if there is no other source of income and, at times, feed on the animals. When there are no rains, the prices of livestock are very low and this situation is made worse since food shortages mostly coincide with these droughts.

During the wet season, livestock prices are high, though this depends on other factors such as those periods when parents are selling their livestock for their children's school fees. In such cases, livestock prices are low because of oversupply versus demand, given that almost everyone is selling livestock. The livestock rearing practice in the division is the free-range system, whereby animals are taken out to graze in the fields without being restrained in any paddocks. Paddocking is not common because previously many households had large parcels of land.

4.1.3 How the farming system affects household food security

The study findings indicate that the crops and animals kept by the households in Kasikeu division play a great role in ensuring that these households have access to food. This is because as earlier stated, many of these households access food through farming. When it rains well, these households harvest enough food that should keep them going for quite some time. However, this is not the case many times in the division, principally because they depend on the harvest both for their domestic consumption as well as their main source of income, and during

harvest time, the crop prices are quite low and therefore households sell a lot of their grains at throw-away prices to be able to meet other needs. Lack of cash crops suited to the climatic conditions such as cotton has also contributed to food shortage in the division. This is because the prices of cash crops are stable and they can offer an alternative source of income when the prices of food crops are low.

Further, inconsistent rainfall patterns have led to intermittent food shortages, whereby the area is characterized by seasons of plenty and those of severe food shortages. Thus, households do not have continuous access to the nutrition required for them to live a healthy and active life throughout the year. When the households harvest a lot of food, they are unable to plan how much to keep since they do not have large stores to store extra grain and, therefore, pass the cost of storage to the middlemen.

Though the area of study falls under a semi-arid zone, households in Kasikeu division do not plant crops that are well adapted to semi-arid conditions such as millets and sorghum. The high preference for maize leads to poor harvests when rains fail and/or when the rains are insufficient. Maize is preferred because of its high market price and the less labour needed during harvest time. In addition, millets are prone to bird attacks and the absence of children to watch over the crop has contributed to its decline in production. Millets and sorghum also require more labour compared to maize in post-harvesting activities. The over-dependence on rain-fed agriculture implies that any poor weather condition inevitably leads to heavy drops in production, famine and death of livestock. Further, over-reliance on a few crops that require a lot of rain such as maize, beans and pigeon peas puts these households in a vulnerable position when the rains are not sufficient.

Though livestock plays a great role in food sourcing activities in that they are either a direct source of food, assist in farming or are sold to buy food and to meet other domestic needs, their role in ensuring household food security is limited because they are equally vulnerable to drought as the crops are when the rains fail. As already stated, improved varieties of livestock are only kept by a few households due to their high demand for feed and costs of veterinary care which most of the households in Kasikeu division are unable to afford.

Intervention mechanisms by the government in times of famines/food shortage include relief food. Though relief food is important, households cannot depend on it wholesomely when they do not have any other source of food. This is because there are no specified dates for distributing this food and also the rations are too inadequate to feed a household for a long period of time. Though most people assume that relief food is a chief source of support especially during famine, such a view is not true as observed by the researcher, who attended relief food distribution sessions, and also as confirmed from the interviews she carried out. This is because relief food was given, on average, twice or once in a month and the distribution dates were not consistent, thus household members would go for relief food only to be told to come at a later date. An average household size of about 6 - 10 people was given about 10-15 kilogrammes of maize, at times a kilo or two of beans and a litre, at most, of cooking oil when it was available.

When respondents were interviewed later how long the relief food lasted, they responded that this relief food lasted for a few days and therefore they had to look for alternative means. In addition, whereas livestock can be an alternative buffer mechanism during such times, these animals become a liability in times of food shortage because of the poor livestock prices and their need for feed and grass during such harsh times. Asked about the source of income used to buy food and meet other domestic needs especially during periods of famine, some households stated

that they sell off their animals while others depend on off-farm contributions from other family members (Table 4.2).

Table 4.2: Households methods of coping with famine

Coping methods	Frequency	Percentage
Purchase food	77	77
Keep enough for all seasons	10	10
Keep some and purchase more	7	7
Purchase and borrow from friends/relatives	4	4
Relief food supplies and purchasing	2	2
Total	**100**	**100**

In conclusion, therefore, the agricultural production system practised by households in the area of study does not provide them with a continuous access to food. These seasonal variations in food production in the division and variations in food prices in times of bumper harvests are critical factors that have contributed to transitory food insecurity experienced by these farming households. Further, due to the cutting down of trees for fuel and charcoal burning, there is increased risk of chronic food insecurity because of the changes this has on the weather patterns. The district development plan (Kenya, 2009) states that 91.9% of the households use firewood for fuel, while 4.4% of the households in the district use charcoal fuel and that households have turned to charcoal burning as a source of income.

Those households without productive assets that can be exchanged for food when crops fail have their coping strategies increasingly eroded especially with the death of the livestock,

which are kept as capital investment for the future. Thus, consecutive crop failure has led to the erosion of the economic base of these farming households, and this is the main reason why some households are mining sand along riverbeds and burning charcoal to be able to get income; since a great percentage of the population depends on agriculture for their livelihood.

4.2 Land ownership patterns and their effect on household food security

Land is one of the basic factors in the production of food and it is the productive asset which mainly determines access to food in rural areas. Thus, household food security among rural households can be said to be closely related to land tenure and to the size of the land holdings.

In Kasikeu division, land holdings vary among households, especially among the locations. Households in Mumela and Kasikeu locations have relatively small farm sizes in comparison to most households in Kiou location. In addition, the soil types in these two locations are sandy and rocky in most areas compared to the loam/red soil found in Kiou location, though a few households live in some rocky areas in Kiou location. Those households having small land sizes have bought land in Kiou location, land which has been passed down through several generations thereby contributing to the shrinking land holding sizes in the division.

The survey found that there is great variation in food production within the division. As mentioned earlier, Kasikeu division is divided into three locations - Kasikeu, Kiou and Mumela. In Kiou location, most of the households produce a lot of food mainly because of the rich red/loam soil favourable for agricultural production. In addition, the households averagely have larger farms compared to those in Kasikeu and Mumela divisions. However, Kiou sub-location, which is in Kiou location, has rocky soil, which is not favourable for agricultural production though the households have large farms.

According to Kenya ((2009), the district where Kasikeu Division is located has two population patterns. The highly productive hilly areas of Kasikeu and Mumela Locations are overpopulated. This has resulted in land scarcity and people have migrated to lower parts of the division such as Kiou Location in search of settlement. Kiou Location, on the other hand, has medium population density, and is in the transitional zone where the dry spells are more or less equal in rainfall amounts and water is generally scarce. With time, the land holding capacity has reduced because of the continued in-flow of people from other areas who have bought land in the division, in addition to the rising population growth.

In Mumela and Kasikeu locations, there is a problem with the soils because these are either sands or clays, though people have access to seasonal rivers. According to the data gathered from the field, those households with clay soils have a problem when farming. First, these soils become too hard to plough before the rains, thereby forcing the farmers to wait till it rains. This is a disadvantage for those households with large farms who do not have access to tractors, which are faster when planting. Second, these soils are susceptible to water logging, especially when it rains a lot. This leads to stunted growth of the crops if the water levels are high. In situations where the rains stop early, crops planted in clay soils wither earlier than those in red/loam soils.

The households that have farms with sandy soils do not plant early and therefore wait until the first rains come so that their crops are not swept away. However, such households are able to plant vegetables and crops that need water such as bananas and arrow roots when it is dry but rivers have water.

Kiou location has the highest food potential, though water is scarce. This forces households to spend a lot of time looking for water. The members of these households walk

several kilometres to get to the water points, which they have to buy at a fee, both for domestic use and to water their animals. During the dry season, water in these points dries up or comes only for a few days; therefore, household members have to walk farther to look for it. The purchase of water is a disincentive to these households because they cannot irrigate their farms. Those households without a regular income are therefore forced to sell part of their produce to get cash to buy water and meet other domestic needs. When these households are faced with food shortages, the little income they get has to be sub-divided between purchasing food as well as buying water for domestic use and for their animals.

Information obtained from the land surveyors based in the division, who were part of the key informants, indicates that land in Kasikeu division is under demarcation. The division is divided into five adjudication sections, namely:

- Kasikeu adjudication section which is under the arbitration board;
- Kiou adjudication section under objection stage;
- Mumela adjudication section under the committee stage;
- Wathini adjudication section under the objection stage; and
- Uvaleni adjudication section, which is under appeal to the minister.

Women are the most vulnerable members of poor families as they are tied to the home (culturally or biologically), and are therefore constrained from seeking alternative means of livelihood. Land is a principal factor of production, and so access to and control over land is critical to these households whose main source of food is through farming. The study findings suggest that women usually have access to land by virtue of their positions as wives and mothers. This makes the women vulnerable to the risk of losing land if their marriage breaks. This is especially so should there be differences in production objectives between men and women in the

household. Women, by virtue of being mothers would have their primary objective in farming as producing enough for the household.

From the interviews conducted, 92% of the respondents said that the entire household benefits from the land in terms of use, though men have an upper hand on how this land is used, except in female-headed households. However, 8% said that only the household head benefits from the land use.

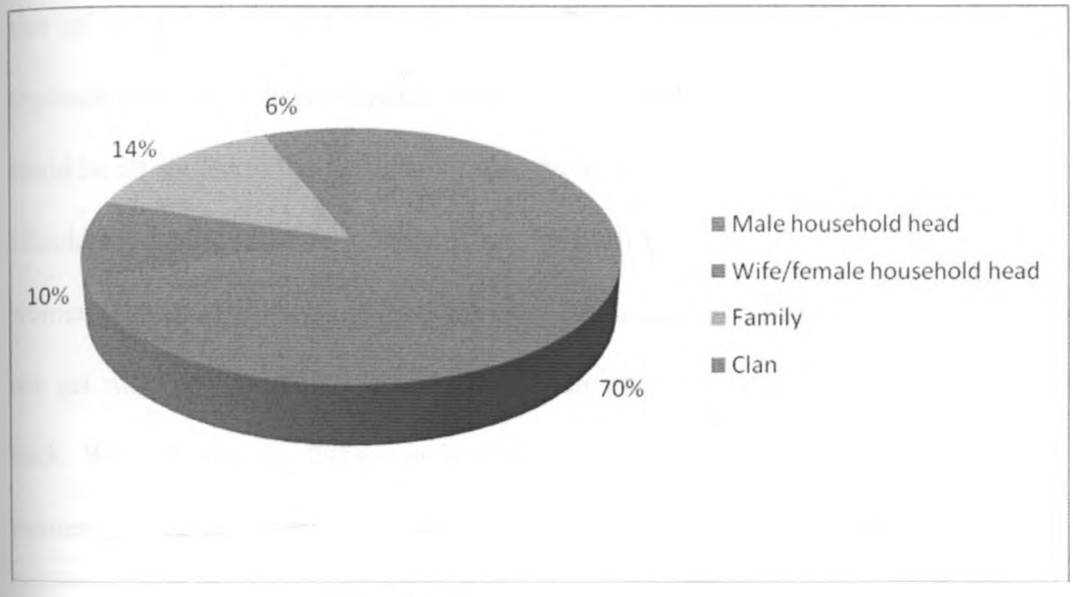
When asked who owns the land, 70% of those interviewed said that land belonged to the male household head. Only 10% responded that land belonged to the wife/female household head. This is the case where single women have either bought their land, have inherited especially if their parents did not have a boy child and such women decided not to get married, or where widows have inherited such land from their husbands – they hold this land in trust for their sons, though their decisions are held above those of their sons in cases of disputes. Asked why widows do not own land one of the elderly men said that it is because the Akamba believe that women are supposed to be married.

Similar observations are made in a study done by Nzioki, who noted that though there are widows with land under their own names, such women only inherit as legal custodians on behalf of their sons. These widows have limited control in land, which is not equivalent to full property rights granted for men under titled land (Nzioki, 2000: 150).

Six per cent of the respondents said that the clan owns the land. On the other hand, 14% responded that the family owns the land. This implies that both the man and the woman have equal share and say on matters regarding land and these are the households that have bought the land. In the area of study, land is still owned by the extended family, is controlled by the household head and such land is normally sub-divided when the household head dies. This is

because when the household head is still alive, he does not want to relinquish such ownership to the sons, since he feels that he will lose control of the land and thereby control of the entire household. The household members farm and build after consultations with the household head. Such people may not be able to do extensive farming or keep animals in large numbers since they do not have absolute control over the land. The patterns of land ownership are summarized in Figure 4.1 below.

Figure 4.1 Land ownership



On land acquisition, 79% of the respondents stated that they acquired their land through inheritance, 12% purchased, and 9% got their land through good-will or transfer. The female single parents fall under this category of accessing land through good-will or transfer and, in such cases, they are given a portion of land by their brothers to farm, if they are not in a position to buy their own. Such a situation takes place only if these women have never been married since their childhood, though some get children in their maternal homes. In some circumstances, when a woman loses her husband and her in-laws are not able to take care of her, her parents take her

back and give her some of the family land for herself and her children. However, such a practice is being dropped with time because family land is becoming smaller and smaller as generations come and go.

One key informant, a land surveyor based in the division, stated that in situations where women inherit land, this takes several forms. In the first form, the daughter co-owns the piece of land with the parents and, in this kind of an arrangement, her name appears in the land title deed together with that of her parents. In another form, she holds the land under her own name but the size of land given to her is normally smaller compared to that of her brothers. There is no explanation for this discrimination in land holding sizes between sons and daughters, though this could be attributed to the fact that women are not entitled to inherit land in their maternal homes. Should the parents decide to sell-off her land, all they need to do is to inform her. In addition, women who have been given land can only claim their ownership of that land as long as they do not get married. Once they are married, their ownership ceases and the family takes the land back. When husbands, fathers or brothers mortgage their land for credit, the rights of related women (wives, daughters and sisters) who use the same land are at risk.

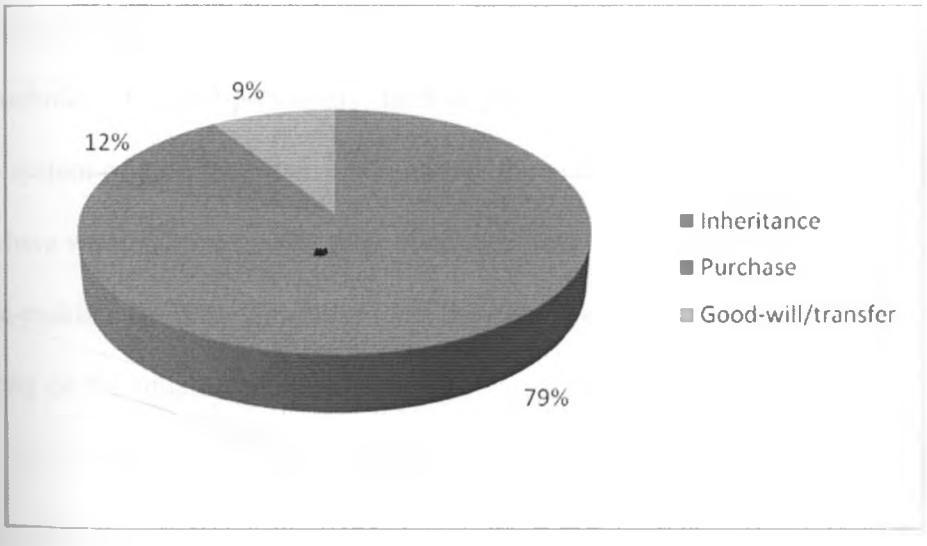
Writing on the issue of inheritance, Nzioki (2000) states that women usually inherit land under very restrictive conditions as the researcher found above. For example, daughters enjoy little social legitimacy and the likelihood of daughters inheriting land is only where families have no sons. She further notes that cases of daughters inheriting land directly and unconditionally from parents are rare and that there is still widespread resistance to the idea of daughters getting shares in the titled land (Nzioki, 2000:138).

This researcher also held some discussions with women in the area of study and asked questions on the inheritance of land by daughters. The women strongly felt that it is only men

who are supposed to inherit land from their parents. This is because they believe that women are meant to get married and do not need land in their maternal homes and that only sons can help their parents. They believe that once daughters get married, their husbands may restrict them from helping their parents. They said that women have their portion of land in their husbands' places, unless a family does not have sons. Those households without a son are seen as unfortunate.

In families where land has been passed on for several generations, such land has become too small to accommodate the people occupying it. In some cases, those able members of the household have opted to buy land either near their homes or even far away. Figure 4.2 below shows the forms of land acquisition in the study area.

Figure 4.2: Forms of land acquisition



The study finding indicate that those households that have acquired land through inheritance and such land is owned by extended families and controlled by the household head or clan, are constrained on the number and also the type of animals that they can keep. Their farm sizes are

also restricted, especially if the land size is small. This situation is typical in those households where the members have not been able to buy extra land. In the area of study, land is still under demarcation and most families live without land title deeds. This means no household member can acquire a loan in case they desire to improve their farming practices. In addition, household members who own land jointly with other relatives are not free to make decisions in terms of land use no matter how beneficial such decisions might be. Such households are forced to continue using the land while they are not sure of their portion, and this is a hindrance to land development efforts such as heavy investments in improved agricultural technology. Further, continued population growth and strong inheritance traditions of passing land down several generations have contributed to the shrinking of landholding sizes.

When interviewed on how land ownership affects agricultural production, 18% of the respondents said that its only one gender that inherits and therefore makes decisions in the household. In cases where women buy their own land, they are the ones who make decisions in the household. As stated previously, land is inherited and owned in greater percentage by men, and the system of land inheritance perpetuates the male domination in agricultural production. In cases where women have bought their own land, have inherited or are widowed, independence in decision-making leads to flexibility and they are free to implement any favourable decision, depending on the situation at hand.

When asked who makes decisions in the household concerning land use, one of the female respondents said the following:

> We (referring to the children and herself) do not make any decision until our father (the husband) tells us when to plant and where to plant. We cannot make any decision concerning land use and disposal of the livestock because the land belongs to him in addition to the livestock.

Another female respondent, who is married as a third wife, commented the following when asked on how the form of land ownership affects agricultural production:

> The piece of land that I farm belongs to my husband. Even if he decides to take it and give it over to another woman, I cannot question him since I do not own any land.

On the issue of land inheritance, she responded that:

> It is men who own land and are allowed to inherit. Women are meant to grow up and get married, and then they can use their husbands' land. If some women do not want to get married, they should work hard and buy their own land so that they can settle.

Table 4.3 below summarizes how patterns of land ownership affect the agricultural production in the study area.

Table 4.3: How land ownership patterns affect agricultural production

Effect	Frequency	Percentage
Limits the size of land under cultivation	48	48
Flexibility in decision making for single women	18	18
Only one gender inherits land and therefore makes decisions in the household	16	16
Constrains the animals kept and crops planted	11	11
Limits the size of land under cultivation and only the gender that inherits makes decisions on land use	4	4
Proceeds from the land are owned by the household head only	1	1
Cannot diversify without permission	1	1
Best decisions are made by both partners in the household	1	1
Total	**100**	**100**

From the focus group discussions, men control land and money, which form the important family resources and, therefore, they make decisions on how these are used. Women

have more control over poultry. Although the women expressed interest in owning land independently, the only constraint expressed was lack of resources to buy the land. This independent ownership would reduce their dependence on their husbands and/or the families they are married into.

The above view supports Njiro's (1990) study which found that scarcity of land meant that owners of land (usually men) are the sole decision makers regarding the allocation of land to crops. Women's position is weakened by the fact that where there are disagreements between them and their husbands, men refer to their ownership of land and all its movable and immovable property thereby demonstrating their dominance in gender relations (Njiro, 1990:218).

Although women can inherit land, very few are aware of this and, besides, almost all those who are aware would shy-off from claiming their inheritance since cultures make them believe that land belongs to their male siblings or relatives. This is compounded by the attitude of their male siblings who feel that their fathers' and mothers' land is rightfully theirs and no part belongs to their female relatives.

4.3 Respondents' recommendations on how to achieve household food security

When asked on what should be done to ensure that the households in Kasikeu division have sustainable access to the food they require, discussants in the focus groups said that the provision of water, mainly for irrigation when rains fail, would be vital. This would ensure that they are safe, whether it rains or not. Secondly, a cereals' board would help in stamping out exploitation of farmers by middlemen, such that households sell their food at reasonable prices. When food shortages occur, these households can then buy from the cereals' board at reasonable prices as compared to the prices fixed by the middlemen.

The need for the revival of the cotton ginnery in the district was also cited, so that households need not depend on their food crops but have extra income from the cash crop grown. This would go a long way in helping preserve the food produced in the household since the households will not need to sell their food crops to be able to get an income. Other respondents said that there should be certified outlet markets where farming households can comfortably purchase pesticides as well as medicines for their animals. This is because households in the past have purchased counterfeit pesticides and even medicines for their livestock, leading to death of these livestock and, worse still, their harvested crops being destroyed by pests. Though there is one livestock and two crop extension officers in the division, their participation and interaction with the farmers is minimal and respondents often complained that these extension workers hardly gave them any solutions to the problems they encountered when farming.

Other respondents recommended the need for farmers to be trained on proper methods of farming. Availability of agricultural implements within reasonable reach was recommended in that it will help the farming households cut costs of travelling. Respondents highlighted provision of farmers' loans tailored to their needs for those households that would wish to do extensive farming. Some respondents cited examples of how when they were farming cotton, the Cotton Board outlet at Kasikeu market loaned them hand sprayers and pesticides. They would pay for these items after harvesting since the board was the sole buying agent of their cotton crop.

In conclusion, though the land ownership system favours men because of inheritance patterns, women's position can still be improved through capacity building in education so that they can have options to make a living, should they find themselves not having access to land. In addition, when women are literate, it may be easier for them to adopt and use with ease advanced farming technologies and manage their farms better.

CHAPTER FIVE

CONSTRAINTS FACED BY THE FARMING HOUSEHOLDS

5.1 Introduction

This chapter presents findings on the constraints faced by the households in crop and animal production. These constraints affect the amount of food available to these farming households as shown by the study results presented below.

5.2 Constraints faced in crop production

The constraints faced by the farming households in crop production are various and present themselves at different times of the year. When producing crops, farmers face constraints right from the time of planting up to harvesting, and even after harvesting, especially when storing and selling their produce.

a) Challenges faced when planting

Since the area of study falls under the semi-arid zone, there is need for farmers to utilize the available rainfall to the maximum by planting early enough so that by the time the rainfall stops, the crops planted can ripen. From the survey, the following were given as the constraints faced by farmers in an effort to plant early. Twenty-seven per cent of the interviewees said that the major hindrance was lack of draught power. Ox-drawn ploughs are mostly used when planting and since drought comes before the rainy season, these animals are normally too weak to plough large tracts of land/farms in a limited period of time.

Thirty-two per cent of the respondents cited the lack of seeds as their main hindrance when planting. Lack of seeds for planting affects most households because of famine and lack of income to buy these seeds given that during times of food shortage, the prices of crops are

normally too high for households to buy adequate food and have extra money for buying seeds. Inadequate seed/seed selection knowledge further leads to poor harvests as some households lack seeds to plant and when faced with this problem, some buy from anyone and/or borrow uncertified seeds.

Twenty per cent of the households said they were unable to plant early due to lack of mechanized agricultural technology, and depend on manual labour provided by the people weakened by hunger. The demand for manual labour is normally at peak during the productive times of the year, such as when planting, weeding, harvesting and carrying out post-harvest activities. This is because when using ox-drawn ploughs, more people are needed than when using tractors. Further, the households cited lack of finance.

Five per cent of the households indicated that they did not have any problem in planting. Such households either have small farms or have income to hire mechanized implements for planting. Very few of the households in the study own tractors and such households plough for those who are able to hire their services.

Sixteen per cent of the interviewees said that the soils are poor, especially the clay and sandy soils. Clay soils are very hard during the dry spell, forcing farmers to wait until it rains so that they can plant. An additional problem presents itself after it rains should such rain be too much because such soils become water-logged, forcing households to wait for water levels to go down. This leads to loss of timelines for planting, especially for those with big farms but lack modern technology for ploughing.

Households in areas with sandy soils have to wait till it rains so that their crops are not swept away by the first rains. Such soils are also poor and need manure or fertilizers during all

seasons due to leaching. Those who have money buy fertilizers but those that do not have plant without. The above findings are summarized in Table 5.1 below.

Table 5.1: Constraints faced by households when planting

Constraints	**Frequency**	**Percentage**
Lack of seeds	32	32
Lack of draught power	27	27
Inadequate human labour, lack of finances to hire labour	20	20
Poor soils	16	16
No major problem	5	5
Total	**100**	**100**

These constraints impinge on household food security because they affect food production right from the planting time, given that most of these households access their food supplies from farming. The coping mechanisms to these constraints are shown in Table 5.2 below.

Table 5.2: Coping mechanisms for planting problems

Coping Mechanisms	Frequency	Percentage
Purchase seeds	30	30
Hire draught power	13	13
Wait until it rains	12	12
Borrow both draught power and seeds to plant	11	11
Borrow draught power	7	7
Farm with people available	5	5
Hire human labour	5	5
Plant before it rains	5	5
Hire mechanized power	2	2
Request friends to help	2	2
Use hoes till planting is completed	2	2
Hire draught power and buy seeds	2	2
Have no problems	2	2
Use draught animals though weak	1	1
Plant as much as possible	1	1
Total	**100**	**100**

b) Weeding

After planting, the next step is weeding and even here households face several challenges. Sixty-seven per cent of the respondents cited lack of human labour as a major constraint. This could be attributed to the fact that more labour is required when weeding. Twelve per cent of

those households that were interviewed said that inadequate access to machinery is normally the problem. In the area of study, ox-drawn ploughs are used when weeding in fields planted with maize only and this mono-cropping system requires large farms. Those who mix crops cannot use ox-drawn ploughs and so are forced to use hoes to weed. Such households normally have small farms.

Those households in areas with clay soils face additional problems of having to wait for water levels to go down before weeding. This delays them and such crops are the first ones to wither if the rains stop for some time. From the focus group discussions, the problem of poor soils was cited as a major factor that affects the amount of food harvested. Though the respondents said that they sometimes add manure, this practice is inhibited by the reduction in the number of animals kept due to the small land-holdings. Further, lack of transport facilities for manure restricts some households from taking it to those farms that are especially far off. Low income levels among the farming community further limits the ability of the households to purchase manure or fertilizers.

Labour input is another important factor in production. In Kasikeu division, women provide much of the labour needed in their farms especially when weeding such crops as finger-millet and beans. Men prefer weeding with ox-drawn ploughs. However, if the household head is in a position to pay someone to help, then the load of farmwork initially meant to be done by the woman is reduced. In situations where the household head is working elsewhere and is not in a position to pay someone to help the wife, the wife has to do the entire household and farm labour alone, though the children may help her if they are available. Where the household heads are women – whether widowed, single or divorced – if they do not have extra income, then they have to do all the work by themselves.

In some households where some family members working elsewhere are in a position to pay someone to help back at home, then such households are better placed because of the high demand for human labour, especially during planting, weeding and harvesting periods. Though children may help, they are only available over the weekends and cannot be relied on much to help especially during those times when farm labour is at its peak and households have to plant early enough to make maximum use of the available soil moisture.

For those male-headed households whose spouses are at home, the wives are helped in some duties, especially with the farm labour. However, domestic duties such as fetching firewood and childcare activities are left to the woman. Men give a hand in some chores such as fetching water on condition that they do not carry water containers on their backs. They only participate in this activity if they are using ox-drawn carts, bicycles or wheelbarrows. This implies that if none of this equipment is available, then men cannot help in fetching water. It is only women in the division who carry water containers on their backs. Women do additional chores, especially in hoe weeding and post-harvest activities that are aimed at cleaning up the harvested crops before storage. The researcher was able to make such observations not only during the period of study but even before this, given that she comes from the area of study.

Bird-David *et al.* (1998) made similar observations and state that the following activities are the ones done by women only in most male-headed households: - fetching water, fetching firewood, housework, herding and child-rearing (Bird-David *et al.*, 1998:91). Table 5.3 below summarizes the problems that households face during weeding time.

Table 5.3: Challenges during weeding

Challenges	Frequency	Percentage
Lack of human labour	65	65
Inadequate access to machinery	12	12
Type of crops planted	9	9
No problems when wedding	8	8
Type of soil (clay/rock)	4	4
Big farms to be weeded	2	2
Total	**100**	**100**

Table 5.4 below shows how these households cope with the challenges they face when weeding.

Table 5.4: Coping strategies for weeding problems

Coping strategies	Frequency	Percentage
Weed as much as possible using hoes	34	34
Hire human labour	26	26
Use household human labour and draught power	21	21
Weed as early as possible	5	5
Borrow machinery	4	4
Request friends to help	4	4
Wait for water levels to go down	3	3
Wait for children during weekends	2	2
Use herbicides	1	1
Total	**100**	**100**

c) Harvesting

Harvesting forms one of the most important processes in food production. The constraints faced by households have serious effects on the household's ability to be food secure. From the survey conducted, 42% of the respondents said that lack of adequate human power was the major hindrance, especially during or after the first rainy season, which falls between November and March. This is because the second season starts immediately after March. Such rains interrupt harvesting since most people are still taking their harvests home. If the households are not fast enough, their crops get rained on and they may delay planting for the next season. When households are not able to plant in the second season, they have to depend on the harvest they got from the previous season, though this may not take them for long.

Lack of transport for the harvest from the farms was also highlighted as a major challenge when harvesting by 39% of the respondents. This is mainly due to lack of oxen and also carts. Pressure of time due to other domestic activities was cited by 8% of the respondents. Most of these were mothers with young children to care for. Other domestic duties, such as fetching water and grazing animals takes a lot of time. This is because most of the division has scattered water points, and so the residents have to walk many kilometres to get water or water their livestock.

Four per cent of those interviewed said that problems of harvesting arise when the crops dry at different times, some extending to the next season, especially during the first season. This happens due to delayed planting on some farms. Such crops have to be harvested before they dry up completely, forcing the households concerned to dry them out in the sun. At times, this is not possible because planting takes place at the same time. Due to this, some of these crops go bad and this reduces the amount of harvest available. This is common in those households that have

large farms but are not able to hire labour. A summary of these constraints faced when harvesting is presented in Table 5.5 below.

Table 5.5: Constraints faced during the harvesting period

Constraints	Frequency	Percentage
Inadequate human labour	43	43
Lack of transport for the harvest from the farm	36	36
Time pressures due to other domestic activities	8	8
Different drying times	6	6
Types of crops planted	3	3
No problems encountered	2	2
Inadequate time for harvesting	1	1
Sliding land forms	1	1
Total	**100**	**100**

When asked about the coping mechanisms, 33% said that they hire casual labourers. Since most households do not have cash, they normally pay for these services by giving a portion of their harvests to the hired people. The amounts of crops/grains to be given in exchange for the labour are determined by the prevailing food prices. During the time of harvesting, the food prices go down. This is because the middlemen take advantage of the situation by bringing down these prices so that they can get extra profits when selling in places that may not be having food or after waiting for the food levels to go down so that they can hike their prices. Due to the reduced food prices, a lot of food is given out to these labourers as their payment.

Though 4% of the households said that they request friends and relatives to help, this, however, depends on how close the concerned parties are since this short window for harvesting makes everyone very busy. It is only after harvesting that some people can help those who have not completed. These coping mechanisms are shown in Table 5.6 below.

Table 5.6: Coping mechanisms during harvesting

Coping mechanisms	Frequency	Percentage
Hire human labour	33	33
Use household members to harvest and transport the harvest	29	29
Use draught power to transport the harvest home	20	20
Hire draught power	7	7
Request friends and relatives to help	4	4
Borrow oxen and cart to take harvest home	4	4
Store the harvest when not prepared	3	3
Total	**100**	**100**

d) Constraints faced when selling food

As previously mentioned, there is no cash crop grown in Kasikeu Division. Cotton used to be a major cash crop, but with the collapse of the only cotton ginnery in the district, farmers stopped growing the crop. Not only were the farmers not being paid on time, but also they lacked a place to sell after this ginnery collapsed. Cash crops have the advantage of having stable market prices. This has forced households to depend on their food crops, both for home consumption as well as

for their income, if such households do not have someone working elsewhere who remits some money to them on a regular basis.

Sixty-nine per cent of the respondents said that uncontrolled prices were a major problem when selling crops, especially during and after harvesting. The forces of demand and supply normally control such prices since farmers flood the market with their produce. This problem of inflationary food prices is mainly caused by lack of a cereals board in the district, which can regulate prices. Those markets with fair prices are inaccessible due to the high transport charges. In addition, these households normally sell small portions at ago, leaving the large-scale farmers to sell their crops to cereal boards in other districts.

When selling crops and/or animals to meet domestic needs such as school fees and other food products that are not produced in the household, these households deplete their stocks in a short while and are left to struggle for the rest of the year. A section of the division that is not served by the seasonal rivers does not have access to free water, meaning that they purchase water for all their needs including watering their animals. For families without any regular income, they sell off their crops bit by bit till their harvest is gone.

The researcher tracked the market prices for the crops during the period of study and observed that the prices for maize, which has become the cash crop, were quite low – 8/9 shillings per kilo during the period of study (in the months of March/April 2001) since households had begun harvesting, down from 25 shillings per kilo during the period between December 2000/January 2001.

Households face an additional challenge when storing/preserving the harvested grains, especially after a bumper harvest. This is because there is no authorized outlet in the division that can supply farmers with genuine pesticides and even drugs for their animals; and at times farmers

unknowingly buy counterfeit pesticides. When such households discover that these pesticides are not genuine, they are forced to sell off their grains as soon as they can regardless of the market prices so as to be able to get rid of the grain before the pests destroy them. Poor storage of the harvest affects the sustainability of the available food in the household, with cases such as as aflatoxin being reported after bumper harvests.

In the focus group discussions, it emerged that some farmers use ash and pepper to control pests, though this treatment does not preserve the grains for long. This is because weevils and other pests have become resistant over time. The other possible reason for this resistance is that some of these pests have been introduced into the area through sacks and other agricultural equipment sold to farmers from other places. Though there are recommended pesticides, only a few households can afford them due to the high prices. In addition, there are a few shops that stock them and most of them are not genuine. The respondents in the study said that the best option is to travel to Nairobi and buy the required pesticides and medicine for their livestock from the Kenya Farmers Association. This is possible for those people who have relatives working and staying in Nairobi; those who do not have normally have to travel to buy them. Table 5.7 below has a summary of the constraints that households face when selling their crops.

Table 5.7: Problems encountered when selling crops

Problems	Frequency	Percentage
Low prices	83	83
Inaccessible markets	14	14
Impassable roads	3	3
Total	**100**	**100**

5.3 Constraints faced in livestock production

The focus group discussions revealed that during critical water shortages, animals also get affected because they are not watered daily as recommended, and when they are taken for watering after several days, they do not get adequate water, especially if they are many. This is because in some parts of the division, households buy water for their domestic use as well as for watering their animals. This lack of water, coupled with the scarcity of feeds, makes the livestock weak and susceptible to diseases. Further, uncontrolled livestock movement during the dry spells in search of water and food was said to increase the incidences of disease among the livestock such as foot and mouth disease. New Castle disease was said to be a major killer disease for poultry and claims 90% of the animal population during the months of August, September and October. These are normally dry periods not only in the division but also in the district.

The focus group discussions further revealed that once faced with livestock diseases, only a few of these households are able to afford the fee charged by veterinary doctors. Other discussants said that they buy medicine and treat their animals to cut costs, whereas the rest use herbs. Those who administer drugs to their livestock normally tell from the symptoms and especially from repeated experiences in the past. However, this is not highly recommended given that the animals may show symptoms of a different disease apart from the ones the people are used to treating. Other households try to give them herbal medicine and if they do not respond to this treatment, they are left to die.

In ranking the animals kept, sheep are not kept largely due to their low resistance to disease and low demand from buyers. However, they have low feed and water requirements compared to cattle and goats. Owing to the shortage of livestock extension staff (there is only one

officer in the division) and inadequate transport facilities, farmers are not served adequately. Hand spraying against livestock pests such as ticks is a common practice in the division.

When households are not able to buy water for their livestock, the livestock walk for long distances in search of dams or rivers that have not dried up. Though at this stage the available water in these dams and rivers is dirty and many times contain insects that make the livestock sick, the owners who do not have money to buy clean water often have no choice but to take the livestock to such water points. Inadequate livestock feed, high temperatures, too much dust and lack of water make the livestock weak and susceptible to diseases, which may be the main contributing factor to massive livestock losses during the dry spells. Table 5.8 below summarizes these problems.

Table 5.8: Problems encountered when rearing livestock

Problems	**Frequency**	**Percentage**
Inadequate feed during some seasons of the year	58	58
Diseases	36	36
Lack of people to herd	4	4
Rustling	1	1
No problems	1	1
Total	**100**	**100**

Additional constraints facing these households include lack of an organized marketing system and market outlets. The forces of demand and supply dictate their prices, especially when parents have to sell livestock to raise school fees for their children. During such periods when

students are reporting to school, the livestock flood the market and thereby drive down the prices. Seasonal variations in rainfall amounts and patterns also affect such households, in that the livestock prices are low during the dry season. This could be due to the poor state of the health of these animals and also lack of pasture. Most households sell off their livestock during this dry period so that they do not die. Many households avoid buying livestock when it is very dry because of the challenge of getting pasture and water. Table 5.9 below contains a summary of these problems.

Table 5.9: Problems faced when selling livestock

Problems	Frequency	Percentage
Low prices	83	83
Inaccessible markets	14	14
Impassable roads	3	3
Total	**100**	**100**

e) Weather Challenges

The capacity to produce adequate food supplies depends on such factors as weather conditions, amount of land available, labour input and the technology used. The area of study has been experiencing inconsistent and unpredictable weather patterns. Though at times there is rainfall in the division, this is normally followed by rainfall failure. This inconsistency in the weather patterns affects both livestock and crop farming. Households are not able to plan once they have harvested enough food; they are unable to decide how much they should keep and how

much to sell. Further, it is difficult for households to decide on whether to keep many livestock or to sell.

An example of this inconsistency in rainfall patterns occurred during the short rains season of November/December 2000, whereby there was enough rainfall throughout the season and households harvested plenty of food around March 2001. Though it rained at the beginning of the second season (around April) enough for germination, the rains stopped before the crops were mature enough to produce good results. Thus, though these households harvested enough food to keep them going for some time, they were not able to live on such food for a long time. This is because, as stated before, these households depend on such foods both for home consumption as well as for cash.

CHAPTER SIX

SUMMARY AND CONCLUSION

6.1 Introduction

This chapter summarizes the study findings in line with the objectives that guided the study. Overall conclusions are also presented in line with these objectives.

6.2 Summary

In order to summarize the findings of this study, it is necessary to revisit the objectives that guided the study. As pointed out in chapter one, the overall study objective was to explore the relationship between farming systems and household food security in Kasikeu. The specific objectives were:

1. To investigate how the farming system employed by the households in Kasikeu division affects household food security.
2. To examine the extent to which the constraints faced by these households impinge on household food security.
3. To describe how patterns of land ownership and use affect household food security in the division.

In summary, farming systems employed by the households in Kasikeu division do not provide the farming households with access to the food they require throughout the year. Households face various constraints in agricultural production and they include unreliable rainfall patterns, lack of appropriate technologies to enhance food production and preservation, poor marketing systems and lack of sustainable mechanisms to deal with emergency food situations. The patterns of land ownership affect household food security because households'

lack flexibility in land use for those households who own land jointly and also due to the form of land acquisition prevalent in the study area.

Thus, on the basis of the objectives that guided this study, the following conclusions have therefore been drawn. Regarding the objective of how the farming systems found in Kasikeu Division affect household food security, the study found that the crops and livestock kept play a big role in achieving household food security in the area of study. However, the agricultural output does sustain these households at all times due to a number of factors, and this explains why these households have been experiencing famine. Thus, it is critical to look at sustainability of food access through production, which involves the household's ability to minimize the extent and duration of food deficit so as to regain an adequate supply when faced with shortfalls. However, such resilience is only possible where a household has buffer mechanisms to absorb the effects of short-term production. Because of over-relying on rain-fed agriculture, the farming households in Kasikeu Division lack alternative mechanisms to continue farming when rains fail, such as an affordable source of water to absorb the effects of poor harvests, and therefore they are fragile and highly vulnerable to food production deficits.

The constraints faced when farming contribute to food insecurity at the household level, because they increase the severity of food deficit. The patterns of land ownership and use in Kasikeu Division have been a disincentive to active agricultural production due to restrictions in land use. This is because land in the division has not been subdivided and is mainly owned by extended families unified under one household head. Gender relations in land ownership affect the management of crop and household production in that in most households it is only males who inherit land and therefore make the major decisions in the household, limiting women's contribution though the women provide the bulk of labour required when farming. Lack of

women's inheritance rights to their father's and even sometimes to their husband's land poses the problem of increase in landlessness among women and their children.

6.3 Recommendations

1. The government and development partners involved in food production should empower women so that they can produce sufficient food.

2. The various government ministries involved in providing food aid to households faced with food shortages should improve on their logistical procedures so as to accelerate their response.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE

1. Name of respondent (Optional) _____

2. Date of the interview _____

3. Marital status: Single____ Married_____ Divorced____ Widowed ___

4. Age of the respondent: 15-24____ 25-34 _____ 35 and above _____

6 .Location/ Village _____

8. Size of the household _____

9. How does the family acquire food?

(00) Through farming only

(01) Through purchasing and farm production

(02) Through purchasing only

(03) Through borrowing

(04) Other

9. What crops do you normally plant?

_____

_____

11. Who does the planting?

(00) The mother

(01) The mother and the children

(02) The father

(03) Hired labour and or any of the family members

12. Who makes the decision about what to plant, when and where to plant?

(00) The household head

(01) The person doing the planting

(02) The wife

(03) The children

13. What farm implements do you use when planting?

(00) Hoes

(01) Draft power

(02) Mechanized implements-tractor

(03) Both draft and mechanized implements – tractor

14. What hinders timely planting?

(00) Lack of draft power

(01) Inadequate human power

(02) Lack of seeds

(03) All of the above

15. How do you solve the problem concerning timely planting?

(00) Through hiring mechanized power

(01) Through hiring draft power

(02) Through borrowing of both the draft power and the seeds to plant

(03) Continue to use hoes till one is through with planting

16. Who does the weeding?

(04) The children

(05) The mother

(06) The whole household

(07) Hired labour

17. What is the most common problem that you encounter when weeding?

(00) Lack of human labour

(01) Inadequate access to machinery

(02) Type of crops planted

(03) Other (specify)

18 How do you solve the problem of timely weeding in the household?

(00) Through hiring labour

(01) Through the use of herbicides

(02) Through utilizing the household labour and draft power

(03) Weed the much they can using hoes

19. When it comes to the harvesting period, what constraints do you face?

(00) Lack of adequate human power

(01) Time pressures due to other domestic activities

(02) Lack of transport for the harvests from the farm to the home

(03) All of the above

20. How do you cope with these constraints?

(00) By hiring casual labour

(01) By storing the harvest when it is not prepared

(02) By using draft power to transport the harvest from the farm to home

(03) By doing the harvesting work until it is over

21. Do the methods of storage affect food availability?

(00) Yes

(01) No

If yes, in what ways?

_____

_____

_____

22. How does the choice of the action concerning harvesting affect food availability?

_____

_____

_____

_____

23. What problems do you encounter when selling cash and or food crops?

(00) Inaccessible markets

(01) Impassable roads

(02) Low prices

(03) Other (specify)

24. In what ways does the problem identified in the question above affect the household's food security?

_____

_____

25. What type of animals do you normally keep?

26. How do these animals help in ensuring that there is adequate production of food?

(00) Provide draft power

(01) Can be sold to buy food

(02) Other

26. What are the problems encountered when rearing these animals?

(00) Inadequate feed during some seasons of the year

(01) Diseases

(02) Raiding

(03) Other (specify)

27. How do you solve the problem identified?

_____

28. How do you access food during food shortages?

(00) Keep enough for all seasons

(01) Keep some and purchase some more

(02) Through purchasing

(03) Through borrowing from friends and relatives

(04) Relief food

29. When there are food shortages, where does the family purchase its food?

(00) From the nearest market

(01) From the neighbouring districts

(02) Purchase from far away towns

(03) Buy from middle-men

(04) Other (specify)

30. Where does the household get income to buy food and meet other domestic needs?

(00) Through selling animals, cash crops and other animal products

(01) Depend on the family members working elsewhere

(02) Through income from other occupations

(03) Through the household head

(04) The household members look for casual jobs in order to get some income

31. What factors affect the sustainability of the food that the household gets especially after a good harvest?

(00) Donations to friends and relatives who may not have food

(01) Selling of the food at very low prices, especially to the middle men, so that the family can be able to meet household needs

(02) Poor storage of the harvest

(03) All of the above

32. Who owns the land?

(00) The household head - man

(01) The wife/woman

(02) The clan

(03) Other (specify)

33. How have you acquired the land?

(00) Through inheritance

(01) Purchase

(02) Transfer/good will/present

(03) Other (specify)

34. How does the form of land ownership affect agricultural production?

(00) It constrains the animals and crops to be kept/planted

(01) Limits the size of land under cultivation

(02) The proceeds from the land are owned by the head only.

(03) Only one gender inherits the land and therefore makes the decisions in the household.

(04) Other (specify)

35. Who benefits from the land in terms of use?

(00) The men

(01) The entire household

(02) The entire clan

(03) Other

36. Who inherits the land?

(00) The males

(01) The women

(02) Both men and women

37. What other factors hinder the production and access to adequate food by the household?

_____

_____

_____

_____

38. What constraints farmers from diversifying the crops they grow?

_____

_____

_____

39. When there is food shortage in the area, what factors affect access to food from other areas where there is plenty of harvest?

_____

_____

_____

_____

40. In your view, what should be done to ensure that the residents of this area have sustainable access to the food they require?

_____

_____

_____

_____

APPENDIX 2: FOCUS GROUP DISCUSSION THEMES

1. The types of livestock kept and the crops planted and how these help the household access sufficient food throughout the year.
2. Constraints faced by farmers and how the farmers cope up with them.
3. Patterns of land ownership and use and its effect on the ability of household to be food secure.

APPENDIX 3: KEY INFORMANT INTERVIEW GUIDE

1. What makes households unable to produce enough throughout the year?
2. What factors of production affect farming?
3. What should be done in order to help improve the situation so that these households do not face food shortage?

APPENDIX 4: OBSERVATION CHECK-LIST

1. Farming implements used.
2. Types of soils.
3. Distribution of relief food.
4. Prices of maize.